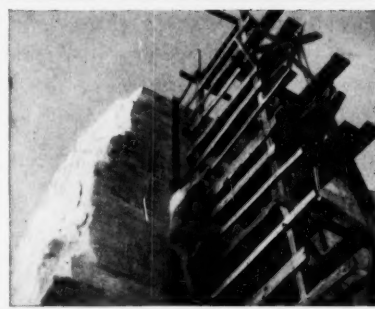
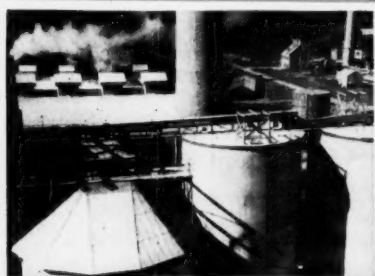


Chemical Week

June 30, 1951

Price 35 cents



◆ **Soda ash**: keystone of alkali turmoil; coming up: significant price changes p. 11

Why do auto finishes dull?
GM researchers probe, propose unique theory p. 19

◆ **CW Camera** tours spanking new cellulose plant; capacity: 200 tons / day p. 21

Army green light for volatile corrosion inhibitors; signals keen competition for greases p. 24

◆ **Sulfur**: Out of the woods by '52; reason: eager exploring, expedient processing p. 33

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June 30, 1951

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OPINION

Problem: Selection

TO THE EDITOR: . . . Your article "Emulsifier Trend: Sharply Up" (May 26) constitutes an excellent general coverage of a very difficult field. The authors' production and use figures are the most complete that have been published as far as we can determine. . . .

It represents a definite advance in discussing emulsification and emulsifying agents to clearly distinguish emulsifying agents from other surface active materials . . . to exclude from consideration those agents which are used primarily as wetting agents, emulsion stabilizers, etc. The principal question remaining is where to draw the necessary lines to effect the proper separation of the emulsifying agents from other widely used surface active compounds.

Authors Sanderson and Abel have of necessity dealt primarily with the emulsifying agents which are used in the greatest quantities. The greatest need in the field of emulsion technology today seems to be adequate means for selecting the proper emulsifying agent from among the great number now offered commercially . . . basing the selection upon the physical and chemical properties of the system under consideration rather than upon empirical trials or historical analogy.

HOWARD M. GADBERRY
Associate Chemical Engineer
Midwest Research Institute
Kansas City, Mo.

Insidious Danger

TO THE EDITOR: I have noted on page 20 of the May 19th issue of your magazine the following quotation from your reporter's interview, in reference to toxicity of ethylene imine:

"An experienced ethylene imine chemist says, 'We have never noticed any physiological effects beyond headache discomfort and eye-reddening. Our safety record undoubtedly is due to the fact that we are aware of the dangers and know what to do about them.'"

. . . Our laboratories have investigated the preparation and uses of ethylene imine over a period of about 15 years. While we agree that ethylene imine is an extremely interesting and promising chemical . . . our toxicity studies have underlined the insidious nature of this chemical.

Its odor is almost exactly like that of ammonia, but its toxicity is manyfold that of ammonia. Thus, it would be possible for an inexperienced

worker to encounter a brief, concentrated dose of ethylene imine without realizing the hazard to which he had been exposed.

. . . Wherever ethylene imine is handled, there should be provision for positive ventilation *away* from the worker, towards the work, with an outside exhaust having no chance of recirculating.

In addition to the vapor hazard, ethylene imine provides a serious hazard in liquid form . . . it will cause severe skin burns and destruction of eye tissue. You may feel that this information is too easily garbled or misinterpreted to warrant publication, but we felt that we should communicate our thoughts on these hazards.

The chlorethyl amines, mentioned . . . in the same article, are . . . not only chemically hazardous but are also severe vesicants and in certain cases, nerve poisons. We do not wish to deprecate or obstruct the work of others in developing uses for ethylene imine, but we have long since decided that most of the end-products or uses for ethylene imine can be achieved by use of less hazardous materials.

In this decision we could . . . be quite mistaken and we hope that those who are now working with ethylene imine will attain the success which they desire.

J. CONWAY
Fine Chemicals Department
Carbide and Carbon Chemicals Co.
New York, N. Y.

Practically Disappeared?

TO THE EDITOR: In the article "Emulsifier Trend: Sharply Up" (May 26) . . . we found that you had presented a very complete and comprehensive survey of the industry and uses.

We note that it is said "domestic shortening consumption in the order of 1.5 billion pounds of which slightly over half is understood to contain . . . glycerides". Our own survey indicates that 50-60% of the hydrogenated vegetable type shortenings and 25% of all shortenings manufactured contain monoglycerides. (Sweetex & Covo SM contain 3% while Crisco and Spry contain 2%.)

Monoglycerides were added to shortenings as early as 1942. Polyoxethylene monostearates were introduced in 1947 for use in bread . . . monoglycerides for the same purpose somewhat earlier. Since the ruling handed down by the Food & Drug Administration (August 6, 1950, Federal Register Vol. 15, No. 152) the P.O.E.M.S. compounds have

U.S.I. CHEMICAL NEWS

June 30

A Series for Chemists and Executives of the Solvents and Chemical Consuming Industries

1951

Sodium Salt of Ethyl Acetoacetate Available In Sample Quantities

The sodium salt of ethyl acetoacetate is now available from U.S.I. in sample quantities. A very reactive compound, the chemical has many potential uses as an intermediate in organic syntheses.

The sodium salt of ethyl acetoacetate reacts with most types of organic halogen compounds to a varying degree. It reacts quite readily with aliphatic halogen compounds, and with aromatic halogen compounds in which the halogen is not on the benzene ring.

The chemical is extremely reactive with the acyl group (COCl), reacting readily with ethyl chloroformate and benzoyl chloride. Other reactions include preparation of ethyl-B-hydroxyethylacetoacetate by reacting with ethylene chlorohydrin, and preparation of aceto-diethyl succinate by reacting with chloroethylacetate.

Properties

Assay
70% by weight as sodium salt
Physical Form
Fluffy powder
Color
Light brown
Bulk Density
40-45 lbs./cu. ft.

New-Type Synthetic Rubber, Made from Milk, Sugars, Tops All Other Rubbers

An improved synthetic rubber, said to be better than other synthetics and natural rubber for many uses has been announced. It is claimed to have outstanding resistance to water, oils, heat, below-zero temperatures and aging. This new rubber is expected to be superior to other rubbers, both natural and synthetic, for such uses as oil seals in automobile transmissions, refrigerator seals, gaskets and linings for fuel tanks.

The improved rubber is made from butyl acrylate and acrylonitrile which can be produced from milk or corn sugars. By varying the proportions of these two compounds, the rubber's property of swelling in oil can be modified. It is claimed, without changing its resistance to heat.

'Inoculate' Timber Against Insects, Decay

A new method of treating timbers for use in coal mines involves injecting certain chemicals into living trees to "inoculate" them against insects and decay. The chemicals used so far in tests include both organic and inorganic compounds in water solutions.

The solutions are reportedly injected into the sap-stream of green trees at the base and carried through the sapwood to the foliage without entering the heartwood or the bark. Treated timbers can be used without removing the bark or waiting for the wood to season. Chemicals tested include zinc chloride, sodium arsenite, ammonium bifluoride, copper sulfate, copper carbonate with ammonium hydroxide and tetrachlorophenol.

U.S.I. to Build New Plant To Produce Allethrin

Allyl Homolog of One of Pyrethrin's Active Principles, Allethrin Will Help Fill Defense Needs for Insecticides

Plans for construction of a plant to produce allethrin, a chemical with some of the unique advantages of natural pyrethrum, were announced recently by W. P. Marsh, Jr., president of U. S. Industrial Chemicals, Inc. The plant, first

to be devoted to commercial production of allethrin, will be located on U.S.I.'s property in Baltimore. Construction is to be started immediately and is expected to be completed late in 1952.

In making the announcement, Mr. Marsh stated that production of the chemical would aid materially in filling the needs of the de-

New 'Yardstick' Measures Millionth-of-an-Inch Film

A new kind of "yardstick" which uses different colors to measure millionth-of-an-inch thicknesses of materials in the form of extremely thin films has been developed. The new tool, called a "stepgag", is said to be used like a yardstick, but in place of linear inches are blocks of different colors, each of which represents a different thickness. The blocks of color are reportedly mounted on a length of glass in the shape of a measuring rule.

Color Varies with Thickness

In films a few millionths of an inch thick, the scientist who developed the gag explained, colors vary with changes in thickness, permitting a particular color to indicate a particular thickness. To use the stepgag, the color of a film of unknown thickness is matched to that block of color on the stepgag which is the same or similar. A thickness reading marked underneath that particular block of color on the stepgag indicates the thickness of the unknown film. Color blocks on the stepgag which the researcher demonstrated run from one-millionth-of-an-inch thick to 30 millionths, although gages with wider ranges reportedly can be made.

The stepgag is said to be proving a valuable tool in research work not only for determining extremely fine thicknesses but also for measuring ultra-light weights. Knowing both thickness and density of a material, its weight can be computed. The gag should be particularly useful in measuring materials deposited on a surface by evaporation.

Lignin 'Waste' Now Used As Rubber Reinforcing Agent

Recent research indicates that lignin, previously regarded as just a waste product of the paper industry, is an excellent reinforcing agent for various types of rubber, including natural, nitrile, and neoprene rubber and GR-S. The researchers found that when they added lignin to natural rubber it gave higher tensile strengths than any other pigment, including carbon black, at the same volume. Added to nitrile rubber it also gave higher tensile strengths, according to their report. The scientists indicated that a novel combination of properties can be obtained by coprecipitation with natural, nitrile, neoprene and GR-S. The low specific gravity of lignin also makes possible a lighter-weight product.



Tests have shown that allethrin has a high degree of effectiveness against house flies, making it a good ingredient for aerosols.

effort for adequate supplies of insecticide materials, especially since pyrethrum has been scarce and is expected to continue in relatively short supply for several years. Factors in the pyrethrum shortage include increased demand for non-toxic insecticides and development of new uses for pyrethrum-type (formulations containing pyrethrins and a synergist) insecticides.

U.S.I. originated the combination of pyrethrins from natural pyrethrum with piperonyl butoxide, a synthetic chemical. The synergistic action of piperonyl butoxide with pyrethrins has not only helped to extend the available supplies of pyrethrum, but has also increased the effectiveness of the older insecticide material. Combination of pyrethrins and piperonyl butoxide are marketed exclusively by U.S.I. — under the trade-name Pyrenone.

Will Supplement Pyrethrum Supplies

Work to date has shown that allethrin has a high degree of effectiveness against some species of insects. On houseflies the synthetic compound is apparently equal in effectiveness to natural pyrethrum, at least under some conditions. In tests against certain other insects allethrin appeared to be less effective than pyrethrum. Careful, thorough entomological investigations are being continued to determine correct allowances of allethrin in formulations and what the behavior of these

MORE

Radioactive Virus Tests Point to Cell Destruction

Recent studies of virus reproduction, employing bacteriophages labeled with radioactive tracers, may hold a clue to the reason polio and other virus diseases spread so rapidly. Test results indicate that in less than one half hour after one virus particle invades a living cell, 200 to 300 emerge simultaneously, destroying the cell.

The viruses used in the test are of a type that attack common sewage bacteria and have all the characteristics of viruses that cause diseases in humans and animals. Under the electron microscope these bacteriophages appear as particles one-hundred thousandth of an inch long, with a head, body, and tail—something like a tadpole.

By labeling various kinds of molecules within the bacteria, scientists hope to determine how viruses reproduce and how they kill cells. According to one theory they use tissue and cell compounds for food. Another theory states that the viruses use the chemical processes of the cell to produce viruses instead of normal cell constituents from the food in the surrounding medium.

CONTINUED

Allethrin Plant

formulations against specific insects will be. Although allethrin cannot be regarded as a substitute for natural pyrethrum for many uses, its availability will supplement the present limited supplies of natural pyrethrum and facilitate the current rapid expansion in the use of pyrethrum-type insecticides.

New Way To Protect Stored Grains

One of the most exciting of the new uses for Pyrenone-type insecticides is in protecting stored grains. Pyrenone® Wheat Protectant and Pyrenone® Grain Protectant, containing pyrethrins and piperyl butoxide, are now being mixed directly with stored grains at harvest time and give season-long protection against insects. These new Protectants, non-toxic to humans and warm-blooded animals, promise to save literally hundreds of millions of dollars' worth of stored grain now destroyed by weevils and other insects each year.

*Reg. U. S. Pat. Off.

Produce Paper From Glass Fibers, Mica

Production of satisfactory paper from glass fibers and from mica has been announced. In the past, except for asbestos, inorganic fibers have not proven suitable for making paper. If it can be produced commercially, glass paper should be useful in making electrical insulation. Its resistance to combustion (up to 800°C.) will probably make it valuable as a wrapping for air-cooled transformers.

The new paper produced from mica is described as a superior dielectric for capacitors. Kraft paper condensers in use currently do not operate satisfactorily above 85°C., it is reported. The new mica paper is claimed to be stronger, to withstand heat, and to have a greater capacitance.

New Data on German Drug Research Available

Descriptions of German developments in the pharmaceutical field are reported available now in the form of English translations of patent applications filed from October 1948 to May 1950. Besides these patent applications, the new bulletin is said to have a section listing over a dozen reports that give detailed descriptions of manufacturing processes for synthetic hormones. Instructions for making desoxy corticosterone acetate, estradiol, testosterone, and progesterone are included. Reports also describe various German analytical methods.

New Book of Abstracts On Polyvinylpyrrolidone

A book of abstracts of all the published literature on polyvinylpyrrolidone, the synthetic blood plasma substitute, has been released. The 188-page volume represents the work of 284 authors and includes literature on patents and patent applications. It contains 227 abstracts covering investigations of the applications of polyvinylpyrrolidone in many phases of medicine. Included are papers on its use with other drugs, such as penicillin and insulin. The abstracts give information on studies, some completed as recently as May 1950, in Germany, England, France, Italy, and Switzerland.

*Reg. U. S. Pat. Off.

TECHNICAL DEVELOPMENTS

Information about manufacturers of these items may be obtained by writing U.S.I.

New-type inks for printing on plastic film reportedly based on vinylite resins for maximum printing quality, color density, uniformity, and smoothness, give permanent adhesion permitting printed film to be wiped clean with a damp cloth without damage to design. (No. 699)

An unbreakable polyethylene wash bottle is said to enable lab workers to dispense liquids in a controlled stream by squeezing bottle. Bottle is fitted with polyethylene spout. (No. 690)

An inexpensive vacuum gauge in multi-station form for coaters, dehydrators, vacuum furnaces, etc., is described as simple to use. All stations read on a single meter and range is from a few microns to 1 mm. of Hg, it is claimed. (No. 691)

A new multi-purpose glue for use as a wood adhesive, abrasive binder, etc., cures rapidly in continuous lumber core binding operations and is also satisfactory for cold press-assembly gluing where heavy glue lines are unavoidable, the makers state. (No. 692)

To provide a lasting smooth coating for polystyrene products, a new lacquer for application in standard spray equipment is said to be available in several colors, to air dry in about 15 minutes, to have good adhesion and durability, and to give an all-over uniform finish. (No. 693)

A new synthetic dark organic wax, claimed to form an effective moisture barrier and to have good electrical properties, is recommended for impregnating electrical components. Other potential uses are for waterproofing and laminating paper, textiles, wood, etc. (No. 694)

An air-drying plastic coating for protection of chemical processing equipment against attack from corrosive chemicals, weathering, and rust, reportedly has high film flexibility, good adhesion and impact resistance. Will not chip or crack, it is claimed; can be used on steel, aluminum, concrete, hardwood, composition board, according to the maker. (No. 695)

Laminated fabrics with a three dimensional effect are reported available for use in fashion goods, draperies, furniture, etc. Color prints and patterns are said to be sealed in between twin layers of vinylite plastic which can be cleaned with a damp sponge. The patterns are embossed with three-dimensional taffeta-weave textures, according to the maker. (No. 696)

New paints that resist temperatures up to 1,900°F. can be applied by conventional methods to wood or metal and will resist moisture, acids, and alkalis, it is claimed. (No. 697)

An improved tall oil said to give fast, hard dry and high chemical resistance, is recommended as a checking oil in varnishes and modifier in flat, semigloss, and full gloss systems, barn paints, and as a wood preservative. (No. 698)

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Acetoacet-para-chloroanilide

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Ethyl Sodium Oxalacetate

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BRANCHES IN ALL PRINCIPAL CITIES

OPINION

practically disappeared from the bread making industry . . . thus we cannot agree with the estimated use in 1950 of 13 million pounds. There probably was about that amount used in 1949 in bread and rolls. . . .

LOUIS L. SHAPIRO
Chemical Consultant
Brooklyn, N. Y.

CW thanks Reader Shapiro for contributing his observations. As he indicates, recent legislation is causing plenty of shifts in the use of emulsifiers in food. The day-to-day changes are difficult, if not impossible, to evaluate survey-wise. But this, say Authors Abel and Sanderson, is true: the three major producers of polyoxyethylene monostearates are still actively producing the compounds, one major bakery, at least, is carrying on with their use.—Ed.

Titanium Tet

TO THE EDITOR: In your recent article, "More Tonnage for Titanium" (June 16), statements were made therein regarding the Stauffer Chemical Company's lack of interest in titanium tetrachloride which are not correct

Our company has produced titanium tetrachloride for many years, has steadily increased its facilities and an expansion program is now under way which will enable us to meet current and near term demands for this chemical.

The article in question has created some doubt in the minds of some of our accounts as to our future interest in this chemical and we fear will adversely affect our future customer relations.

T. A. HASCHKE
Sales Manager
Stauffer Chemical Co.
New York, N. Y.

Ninth and Fourth

TO THE EDITOR: . . . We find your article "More Tonnage for Titanium" (June 14) very informative and fundamentally sound

Regarding the operations of the du Pont Co., we would like to advise . . . that the raw material for the production of titanium tetrachloride is ilmenite ore rather than titanium dioxide, as you have stated . . . Our present production of titanium metal is at the rate of two tons per day.

One minor point of fact should be brought to your attention. Titanium is the fourth most abundant structural metal. We believe that sodium, mag-

nesium and potassium are more abundant metals . . . but they cannot be classified as structural.

R. S. Radcliffe,
Sales Manager,
Specialty Products,
E. I. de Pont de Nemours & Co. Inc.,
Wilmington, Del.

CW thanks Reader Radcliffe for revealing that du Pont has now pushed its titanium output to two tons per day and for spotting that phrase we muffed—"the fourth most abundant metal." Actually, titanium is the ninth most abundant (but not necessarily available) element in the earth's crust approx. (0.6%), is out-ranked by metals Si, Al, Fe, Ca, Na, K, and Mg.—ED.

By People for People

TO THE EDITOR: . . . I have been a reader of Chemical Industries for a good many years now and I've been more than casually interested in its conversion to a weekly. . . . Perhaps the one feature which impresses me most is its readability. Your magazine isn't just a compilation of dry-as-dust data . . . its obviously written by people for people . . . there's zest in your reporting. (Maybe editors aren't stodgy, be-visored fellows after all.)

But there's one thing that has me more than a little curious: Over the months I see the word "burgeoning" cropping up fairly frequently. It's an expressive word . . . and our industry certainly is doing just that. But who on Chemical Week is so fond of the word? . . .

JOHNSON R. CONNOR,
Syracuse, N. Y.

Ed.—Ed.

Kudos

TO THE EDITOR: . . . Each week I eagerly look forward to my copy of CHEMICAL WEEK . . . which is a very fine job. Your whole staff, editorial and publishing-wise, should be commended. . . .

RICHARD L. MOORE
Assistant to the President
Foster D. Snell, Inc.
New York, N. Y.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: The Editor, Chemical Week, 330 W. 42nd St., New York 18, N. Y.

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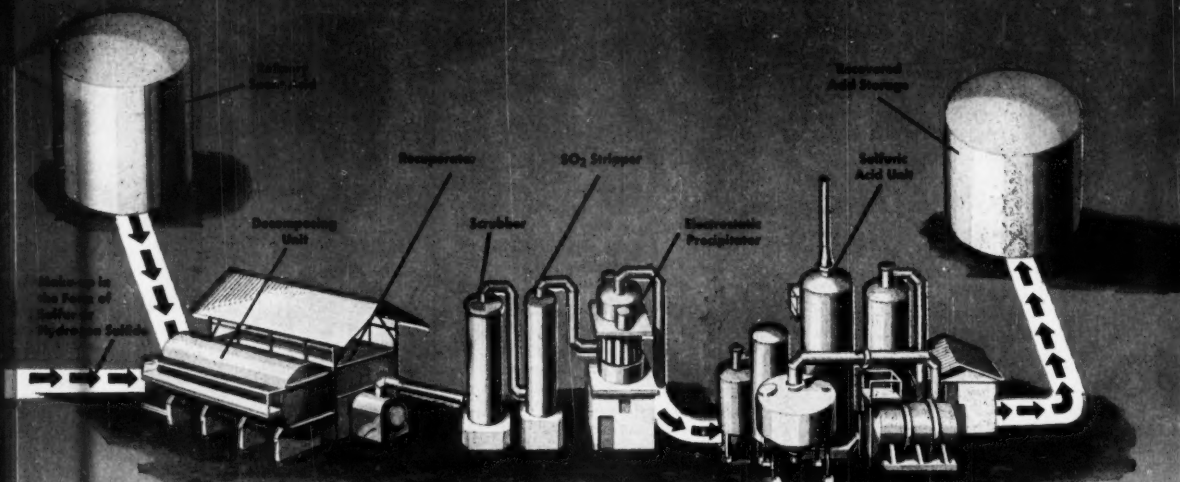
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Due to the increased cost of brimstone and the vital need to conserve basic sulfur deposits, petroleum refiners producing high octane aviation gasoline will find it desirable to recover the sulfuric acid from their spent alkylation acid. For this purpose, Chemico offers a proven and economical process.

In this process, spent alkylation acid—now in greater supply as a result of the increased manufacture of high octane gasoline—is sprayed into a furnace maintained at a high heat with auxiliary burners. Sulfur or hydrogen sulfide may be used as fuel thereby producing SO_2 gas for the production of make-up acid.

A limited amount of other liquid acid sludges, high in hydrocarbon content, may also be added to the alkylation spent acid, thus providing fuel as well as additional acid production. The hydrocarbons are completely consumed and the acid is broken down into its components—sulfur dioxide, oxygen and water. After the water is removed, the gas is processed to fresh acid of 98% strength in a Chemico contact sulfuric acid unit. Send for additional information, stating your requirements.

CHEMICAL CONSTRUCTION CORPORATION

A UNIT OF AMERICAN CYANAMID COMPANY

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*Chemico plants are
profitable investments*

NEWSLETTER

Too little law may be dangerous, but chemical firms this week are beginning to fear the stifling, oppressive prospects of too much legislation in the food and agricultural chemicals field.

One prominent company is thinking of pulling out of food chemicals altogether. Major reason: Indecisiveness, procrastination, and indefinite delay of product acceptance, which will almost certainly be inherent under proposed legislation, will make a pay-off on expensive research even more of a gamble than it now is.

Insecticide and herbicide makers are confronted with a continually lengthening roster of restrictive laws, registration and dealers' fees, and damage suits. Arguments about residue toxicities slow registration procedures, essentially freeze research funds in escrow.

Item: A new Texas law forbids powdered herbicides; and a Texas herbicide dealer must pay an annual fee of as much as \$150. Item: Each brand or grade of economic poison sold in Tennessee requires payment of an annual \$5 inspection fee. Item: A proposed Alabama law requires a registration fee of \$10 yearly for each brand, plus an inspection fee per quantity sold.

The complexity of getting agricultural chemical labels approved in Washington and by various states has forced Carbide & Carbon to set up a special subcommittee of its label committee. It includes members of its toxicology, law, sales, publicity and research groups.

Restrictive price legislation provided a good argument for diversification into chemicals as Armour & Co. revealed its latest quarterly operating figures: As a result of the meat price rollback, Armour lost over \$1 million on its food operations; but saving the day was a close-to-\$4 million profit on non-food lines—including chemicals.

More gripes on the price front have come from makers of plastic products. Claiming that CPR 22 is unworkable for custom molders, they're asking the Office of Price Stabilization to work up a pricing method tailored to the particular needs of the industry's custom segment.

Lack of knowledge of the Government's requirements has put paintmakers in a stew. They want (1) an idea of how much the Federal Government will buy in each quarter, and (2) a study by the Government of what impact these requirements will have, not only on supplies of scarce materials, but also on specifications of paint ordered.

Canada's tariff slash on isopropanol (CW Newsletter, June 9) looked like an opening for U.S. makers of the alcohol, since none was made beyond the border. Now Shell Oil Co. of Canada, forestalling the likelihood of U.S. exports, is putting up a unit adjacent to its refinery at Montreal East to make isopropanol and acetone. A \$3 million plant, it will be completed late next year and produce a total of 20 million pounds a year. With B.A.-Shawinigan's upcoming phenol-acetone output, Canada should be acetone-plenteous by 1953.

Higher production efficiency is currently saving the Government up to a third on its napalm (jellied gasoline) contracts.

Ferro Corp. (Cleveland) is now filling a 2½ million-pound order at 40¢ a pound. Its initial contract, for 1 million pounds called for a 50¢ price, while lowest bids from other producers were at 60¢.

Reason: Ferro's new \$300,000 plant specifically designed for napalm production (CIW Newsletter, May 19).

Silicones are in the spotlight as Dow Corning Corp. awaits Defense Production Authority action on its application for a certificate of necessity to cover a contemplated major expansion.

Meanwhile, Dow Corning has been granted a 75¢ fast write-off for a \$560,000 silicon metal plant, to be installed at Midland, Mich.

This signals a further switch to synthesis of silicones by a direct process from silicon. Dow Corning now makes the bulk of its silicones that way, still operates a sizable unit employing the Grignard reaction (involving silicon tetrachloride, magnesium).

More powdered metals and pigments are in the offing as Glidden Co. presses its expansion program. It is consolidating its powdered metal operations at Hammond, Ind., will boost output.

It is also doubling its titanium dioxide capacity at Baltimore by construction—now nearing completion—of a \$3 million unit. Its lithopone facilities are now being moved to Collinsville, Ill.

Glidden has sold its secondary metals operations at Hammond to a syndicate which will operate as Metals Refining Co., Inc.

Keep your eye on Western Canada—not only as an expanding production area but also as a growing market.

Companies expanding in Saskatchewan, Alberta and British Columbia include Reichhold Chemicals (plywood resin), Consolidated Mining & Smelting (ammonium phosphate), Canadian Chemicals (petrochemicals), Sherritt Gordon (nickel and copper, ammonium sulfate), Canadian Industries Ltd. (explosives), Canadian Salt (caustic, chlorine), Shell Oil (sulfur from natural gas), Royalite Oil (sulfur from natural gas), and the Saskatchewan Government (sodium sulfate).

Also, several pharmaceutical concerns, including Charles E. Frosst, E. R. Squibb, and Ayerst, McKenna & Harrison, have set up their own distribution points in the West to serve increasing markets there.

Some chemical producers got a rude shock and others got a pleasant surprise from the Government this week:

The shock was higher power rates from Tennessee Valley Authority. Reason: higher operating costs. Residential, farm, and small commercial and industrial customers will pay present rates; but large users—including Reynolds Metals, Victor Chemical Works, Carbide & Carbon, Monsanto and Alcoa—will be faced with a 12 to 15 per cent boost when their contracts come up for renewal.

The good news was Regulation 7, a supplement to the Office of Price Stabilization's CPR-22 that gives special consideration to the chemical industry. Now maintenance and repair costs can be added to compute ceilings, and OPS also makes allowance for long-term sulfur contract prices and the special factors surrounding co-products and by-products.



Carol Channing as Lorelei Lee in "Gentlemen Prefer Blondes".

but GENTLEMEN CHEMISTS may prefer Glycol Fatty Acid Esters

This gal may not know an emulsion from a dispersion, but—most chemists know how Polyglycol 400 Monolaurate is used as an emulsifier in insecticides, or how Carbowax 1500 Mono Stearate is used as a dispersing agent in pharmaceuticals. As a matter of fact, if you are a cosmetic chemist, you might be able to tell a rubber chemist or a paper chemist a thing or two about Glycol Stearates and Laurates.

You'll notice in the table below how their uses change as their molecular weights increase. It is a fact that when it comes to Polyhydric Alcohol Fatty Acid Esters, Glyco's laboratory and information file may help you. Why not write for our Ester catalog containing information on how these versatile products might help solve one of your problems? Address Dept. B651.

POLYHYDRIC GLYCOL FATTY ACID ESTERS



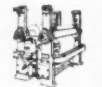
PRODUCT	FIELD	USE
Ethylene Glycol Mono Stearate	Cosmetics	Opacifier
Diglycol Laurate	Paper	Defoamer
	Textiles	Emulsifier
Diglycol Stearate	Cosmetics	Emulsifier
	Paper	Plasticizer
	Metals	Lubricant
Poly Glycol 200 Mono Laurate	Plastics	Viscosity Stabilizer
Poly Glycol 400 Mono Laurate	Insecticides	Emulsifier
	General	Non-ionic wetting agent
	Plastics	Anti-static agent
Poly Glycol 400 Mono Stearate	Textiles	Suspending and thickening agent
	Pharmaceuticals	Suspending agent
Poly Glycol 400 Distearate	Shampoos	Thickener and foam stabilizer
Poly Glycol 600 Mono Laurate	Detergents	Non-ionic surfactant
Carbowax 1000 Mono Stearate	Paper Coating	Anti-gelling agent
Carbowax 1500 Mono Stearate	Pharmaceuticals	Dispersing agent
Carbowax 4000 Mono Stearate	Electrical insulation	Water soluble lubricant
	Textiles	Thickener

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Eastman **B_{ETA} O_{XY} N_{APHTHOIC ACID}**

	Pigment and Lake Intermediate	SPECIFICATIONS Color Light yellow Melting Point 216°-220°C. Assay (Titration) 98.5% min. SOLUBILITY, 25° C. in gm./100 gm. solvent Water Insoluble Acetone 15.3 Ethanol 9.4 Ethyl Acetate 6.8 Benzene Insoluble
	Dye Intermediate	
	Dye Developer	

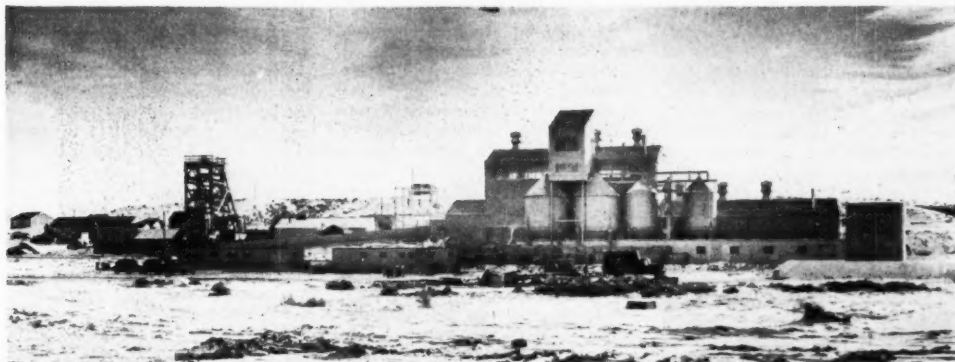
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BUSINESS & INDUSTRY



WESTVACO'S SODA ASH: Trona purification will delay a buyers' scramble.

Alkali Price Change Ahead

Production of electrolytic caustic soda is increasing faster than total demand, presaging an absolute oversupply within two years.

Soda ash facilities have expanded little since the late '30s; ash demand promises to outrun supply within two to three years.

The combination of these two factors, together with continued demands for more chlorine, promises a drastic price realignment in the alkali-chlorine market.

All except a few lingering traces of last summer's strikes at Solvay's and Diamond's soda ash plants have vanished. Soda ash and liquid caustic are once again available for purchase despite the increase in demand occasioned by the Korean crisis.

Producers of caustic soda and chlorine are still wondering how they can get enough chlorine and still get

rid of the concomitant caustic soda. Only saving factor: demand for solid caustic for export.

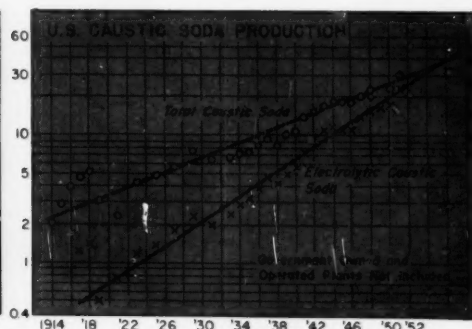
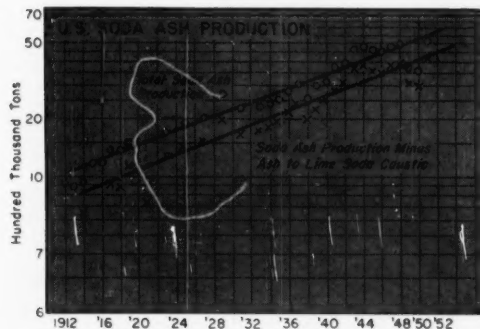
Few Exceptions: Aside from co-production with caustic, relatively small quantities of chlorine will be obtained from National Distillers' and Ethyl Corp.'s new metallic sodium units.

Another increment of chlorine with-

out caustic will come from Solvay's plant to recover additional chlorine from the reaction of salt and nitric acid, which yields sodium nitrate, chlorine, nitrogen tetroxide and nitrosyl chloride. The new plant will recover chlorine values from the nitrosyl chloride.

However, these sources will take care of only a small portion of increased chlorine requirements, which are measured in thousands of tons per day. Thus, if sufficient chlorine is to be made available without a sizable price jump, more caustic must be made—and sold.

There is one exception to the above: In addition to its production by electrolysis of salt, caustic soda is manufactured by treating soda ash with lime. This product is gradually being replaced by electrolytic material, releasing additional low-cost soda ash to meet the continually ex-



panding ash demand without need for new plant capacity.

The last large ash expansion was in the late '30s, and the growth of ash needs is such that—barring an economic upset such as occurred in 1949, or prolonged strikes which cut ash production in 1950—soda ash requirements (excluding that converted to caustic) will equal present total soda ash plant capacity in about two years. Westvaco's new production of ash from trona in Wyoming (300,000 tons per year) will be in operation before that time, extending this date about one year. Thus even if all caustic-from-ash production—44% of the total caustic in January 1946—ceases, more ash capacity will be required by that time, in line with CI's prediction two years ago (*CI, June 1949, p. 936*).

But these are abnormal times—and times of abnormal solidity in demand, particularly for a product that has such varied uses as soda ash. For such materials, decrease in one use will usually be balanced by increase in another. Higher soda ash utilization is expected in manufacture of paper, particularly in production of semi-chemical pulp; and in production of alumina by the Bayer process (which must be exploited to provide sufficient alumina for the projected increase in aluminum manufacture).

The largest quantity of soda ash is used in glass manufacture. The slowdown in building construction will depress the demand for flat glass. But this decrease will to a great extent be offset by higher output of glass containers as glass jars replace hard-to-get tin cans on grocers' shelves.

Caustic for Ash: Fundamentally, caustic soda and soda ash are competitive for many uses; they are both sodium-containing alkalies and are technologically interchangeable for many processes. At present prices, however, they are not economically interchangeable. Most of the present ash facilities were built at price levels which prevailed in the late '30s or before. But from totally new facilities, ash at current prices is an impossibility. A price increase of at least 50% on soda ash would be required to provide a reasonable return.

Pricewise, the soda ash industry finds itself in much the same position as that of sulfur producers. Present operations are profitable but, at existing price levels, the high cost of ash from new facilities makes further expansion a most questionable undertaking.

In any event, sizable price increases for soda ash will soon be required;

and eventually it is probable that caustic soda and soda ash will reach competitive price levels. Indeed, in one case they have already: At least one contract has been let which permits the seller to provide either caustic soda or soda ash at the discretion of the seller, but at a price equivalent with current prices for soda ash.

As can be seen from one of the accompanying charts, the long-term rate of expansion in electrolytic caustic soda production is much higher than that of total caustic output. As soon as total available electrolytic caustic soda equals total caustic soda requirements, pressure for higher chlorine price will be intensified; otherwise new chlorine facilities will not be built. Referring to the charts again, the date is about the same—two to three years hence—as that when soda

ash requirements, as such, will equal the total supply.

Future Pattern: Eventually—and probably in about two years—tremendous pressure will build up for a change in the alkali-chlorine industry price structure, barring technological changes which might curtail requirements for soda ash or chlorine, or boost needs for caustic soda. At that time caustic soda and soda ash will begin to approach a competitive level, with soda ash moving up in price and caustic soda holding steady. Thus, higher costs of new caustic-chlorine facilities will have to be borne by the chlorine alone. In other words, chlorine prices must rise to the point where they will carry a larger percentage of the cost of electrolysis. That, in turn, will force higher prices for chlorine-derived chemicals in current commerce.

Exchange In Drug Know-How

Seven major executives of Schenley Laboratories, Inc., are on the first leg of an extensive European tour this week. Object of trip: exchange of technical information with several large European pharmaceutical firms. The group is under the leadership of Arthur Emelin, newly elected president of Schenley Laboratories, and includes the company's top engineering, legal and business talent. Emelin, when interviewed by Chemical Week in his New York office the day before departure, revealed that the 30 day circuit will include many stops, plant inspections and technical conferences.

Said Emelin: "We (Schenley Labs) feel that foreign trade is a two-way avenue. An exchange of know-how and products is beneficial to pharmaceutical houses on both sides of the Atlantic." Specifically, the "two-way avenue" will take the Schenley party to Ludwigshafen, Germany for round-table conferences with executives of Badische Anilin and Soda Fabrik as the first stop. Next will come visits to the Bayer Company at Leverkusen which will be followed by flying trips to Paris to talk with officials of Roussel Laboratoires, and to Spain to confer with heads of Antibioticos S.A.



EMELIN: "The drug industry has a moral obligation. . . ."

Topics on Table: According to Emelin, conversations with the German companies will center mainly about antitubercular drugs such as the semithiocarbazones and about extenders such as polyvinyl pyrrolidone. At the French company the topic will be new developments in steroid hormones. Progress in antibiotics will be the subject of the conversations with the Spanish technologists.

Know-How: In line with its international thinking and policies, Schenley Laboratories has contributed a good deal of its know-how in the field of antibiotics to several European companies during the past three years. On many occasions it has served as host to visiting technical teams from the foreign companies. And these visits have been augmented by a steady stream of written information going across the Atlantic. Much of this data, Emelin says, was used in the design and construction of Europe's new penicillin and streptomycin plants.

The president of Schenley Labs points out that it is very fortunate that Europe is working to achieve self sufficiency with regard to antibiotics. American civilian and military demands for these materials, he feels, will make it unlikely that our exports can continue at a high level much longer. This is in spite of the fact that almost every major American producer has requested and received a certificate of necessity for needed expansion.

Moral Obligation: It is estimated

Current List of DPA-Certified Chemical Facilities

COMPANY	LOCATION OF FACILITIES	PRODUCT	AMOUNT ELIGIBLE	PERCENT
Mathieson Chemical Corp.	West Point, Va.	Liquid Chlorine	9,149,960	50
Hancock Oil Co. of Calif.	Baltimore, Md.	Ethylene glycol	4,000,000	60
Union Carbide and Carbon Corp., National Carbon Div.	Long Beach, Calif.	Carbon and Graphite electrodes	16,359,600	75
Great Lakes Carbon Corp.	New York, N.Y.	Graphite electrodes	183,000	75
Solvay Process Division, Allied Chemical & Dye Corp.	Morgantown, N.C. South Point, Ohio	Natural gas cracking	6,030,000	85
Solvay Process Division, Allied Chemical & Dye Corp.	Hopewell, Va.	Natural gas cracking	6,000,000	85
International Graphite and Electrode Corp.	Niagara Falls, N.Y.	Graphite electrodes	11,073,000	75
C. K. Williams & Co.	East St. Louis, Ill.	Yellow iron oxide	1,900,200	70

that within the next five years, Europe will achieve its goal of self sufficiency in the field of antibiotics. In fact, there is good reason to believe that many European countries will be able to market such products extensively in their own colonies even before then.

But in spite of this favorable picture Emelin believes that any lessening of American exports must be approached with extreme caution. Reason: The international battle for men's minds. The Schenley Laboratories executive makes the observation: "The drug industry has a moral obligation never to give the opponents of democracy a chance to claim that this country, for sheer business reasons, denied live-giving drugs to the rest of the world . . . a patient in Calcutta, Rome or Berlin, whose life has been saved by American-made pharmaceuticals, is not very susceptible to attack by communist propaganda."

Executive Stockpile

Only 40 miles to a different world—that's the trip from Baltimore to Washington. And if Thomas Nichols has his way he'll make the trip in reverse next week, winding up his duties as NPA's Number Two man to resume his job as board chairman and president of Mathieson Chemical (CW, June 16). Before he leaves, however, Nichols has a few words in explanation of his departure and advice for other executives.

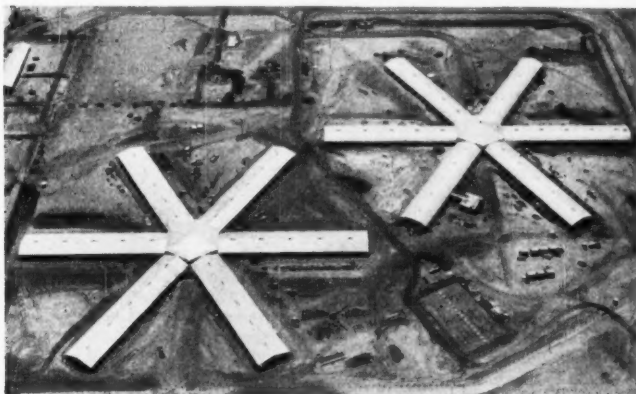
Nichols feels that businessmen ought to devote some of their time to government service: "A man can be very good in industry, but it's important for him to learn the necessity of handling the affairs of all the people."

Rotation: Under the plan instituted by Nichols, an executive would come to Washington, spend about six months on a job, and return to industry. The plan accomplishes a double purpose: Executives would gain by broadening the scope of their activities; and the Government is provided with a stockpile of industrial executives to serve in case of an all-out national emergency.

As far as his own case is concerned, Nichols explained that he came to Washington with the expressed intention of staying for a short time—a month or two. He feels that NPA has now been welded into an efficient working machine with experienced personnel. He calls the agency a "going corporation" and is ready to put his idea of rotation into practice by returning to industry.

As a parting bit of encouragement to executives contemplating Federal service, he denies any confusion there: "Whenever I ask anyone why he finds Washington confusing, I never get a direct answer. When it gets down to specific cases, the confusion vanishes."

A lot of people will take exception to that statement, but all agree that Nichols has done more than his share in bringing order to the city.



Bird's-Eye View of H-Bomb Site

AERIAL PHOTOGRAPH shows the two spoke-shaped office buildings that house officials at the Atomic Energy Commission's Savannah River hydrogen bomb plant (Ellenton, S.C.). The picture was

taken by a newspaper (Washington Times-Herald) photographer on May 24 with the approval of AEC field officers. Commission headquarters in Washington at first refused clearance for printing.

Purchasing Dilemma

Government statistics to the contrary, small business continues to raise the clamor that it is not getting a fair share of defense contracts. One of the objects of attack is the Army Chemical Corps. Its revised code for purchasing was aimed at speeding up the process and spreading the base of supply. Now it is smack in the middle of a dispute over negotiated vs. advertised contracts.

In the months immediately following the outbreak in Korea, the Chemical Corps did the bulk of its purchasing through advertised, sealed-bid contracts. This method is generally satisfactory for procuring standard articles, but not for items which have no civilian counterpart. And 90% of the Chemical Corps' purchases fall into that category.

The presidential declaration of a national emergency, however, authorized negotiated contracts. Procurement officials were then able to deal with firms individually. They could spread the contracts on a broad geographical basis, giving special consideration to small business.

Code Revised: In March, the entire procurement set-up of the Chemical Corps was revised. Under the new system, the country is divided into six geographical districts, with headquarters in major cities (Boston, New York, Atlanta, Chicago, Dallas, and San Francisco).

Each office is charged with the nation-wide purchasing of a class of items. New York, for instance, purchases, mainly, flamethrowers, chemicals (e.g., bleaches), decontaminating solutions, certain types of grenades and napalm.

Each district office is also responsible for the supervision of contracts awarded in its area. Thus a Chicago firm may be awarded a contract for supplying white phosphorus to the Atlanta office. But the Chicago office will do the inspection and acceptance.

A manufacturer seeking a contract for a certain material can get all the information at his nearest district office. Armed with the preliminary information he can then visit the district office that is actually doing the purchasing.

Before negotiating a contract, then, the Corps' officials have a multiple source of selection. They can consult firms which are known sources of supply, those who have visited the district offices, companies with experience in similar lines or which have been recommended by other district offices.

FDA Tells Results of

CHEMICAL	FDA COMMENT
Anti-oxidants	
Butylated hydroxyanisole	Safe.
Gum guaiac	Safe.
Norhydroguaiarctic acid	Safe.
Propyl gallate	Safe.
Thiodipropionic acid ¹	Safe.
Bread Emulsifiers	
Carbowaxes	Relatively inert pharmacologically.
Fatty acid-type	do.
Polyoxyethylene-type	do.
Sorbitan-type	do.
Spans	Produced hives in some cases.
Tweens	Caused histamine-like shock.
Fungicides	
Dithiocarbamates	Not dangerous; decomposes after 10 days of weathering.
Ethyl mercuric phosphate	Tolerable at 0.1 ppm; 1.0 ppm damages kidneys.
2-Heptadecylglyoxalidine	No marked effect on rats after 6 months at 1% dietary level.
Phenyl mercuric triethanolammonium lactate	Tolerable at 0.1 ppm; 1.0 ppm does kidney damage.
Insecticides	
Aldrin	Acute fatal oral dose 50 mg/kg. Ten times more toxic dermally.
Allethrin	Residue of 10 ppm considered safe.
BHC (Benzene hexachloride)	Twice the intake, compared to DDT, needed to produce same liver damage.
Chlordane	Four times as toxic as DDT; shouldn't be used in household sprays or floor waxes.
2,4-D (2,4-dichlorophenoxy acetic acid)	Low acute toxicity.
DDT	Spraying in dairy barns resulted 0.16-1.19 ppm in milk.
Dieldrin	Acute fatal oral dose 65 mg/kg. Ten times more toxic dermally.
Dihydrorotene	In the same toxicological category as rotenone.
Lindane	Safe for dairy barns and household sprays; rapidly metabolized.
Methoxychlor	Safe for spraying directly on cows.
Naphthylacetic acid	Low toxicity.
p-Nitrophenyl thionobenzene phosphonate	Less residual hazard than parathion.
Parathion	Non-cumulative. Dietary intake of 2-5 ppm for a single food item, not hazardous.
Pyrene	Doesn't migrate from paper bags into contained flour. Might migrate through cotton.
Pyrethrins	Residue of 10 ppm considered safe.
TEPP (tetraethyl pyrophosphate)	Not a marked residual poison. Breakdown product caused no abnormalities in rats after 20 weeks at levels of 0.5%.

1. And dialkyl, diaryl esters.

Dilemma: On paper the procurement code looked like an ideal way to speed up contracts and to spread the base. Some companies, however, feel that negotiated contracts are not all open and above-board. Then envision locked-doors and awards to most-favored companies.

As a result, Corps' officers took steps to increase the number of ad-

vertised contracts. But the advertised contracts do not permit multiple awards, which broaden the base. This of course, brings howls of protest from small business.

It all adds up to a knotty problem for the procurement officials. They are attempting to solve it, realizing full well that in trying to please everyone they may wind up pleasing no one.

Military Information Merger

Long-awaited amalgamation of the separate armed forces technical information sections will take place July 1. A single bureau, the Armed Services Technical Information Agency (ASTIA), will take over the job of keeping the Defense Department and military contractors in the know.

But dissemination to businessmen and the public will still be handled by the Department of Commerce's Office of Technical Services. However OTS director John C. Green is happy. The

merger will ease his task of prying loose unclassified and newly-declassified reports; in the future, he'll have to deal with only one set of brass.

The new agency will replace Air Force's Central Air Documentation Office (CADO) at Wright-Patterson Field, Navy's technical reports section at the Library of Congress, and scattered army branches. In line with a directive issued by Secretary of Defense Marshall, a director* and an

* Not yet appointed.

Food Chemical Tests

CHEMICAL	FDA COMMENT
Insecticides (Continued)	
Tetraethylthiopyrophosphate	Less of a residual hazard than parathion.
Toxaphene	Toxicologically similar to lindane.
Resin Coatings	
Methyl polysilicone	Permitted up to 10 ppm.
Methylphenyl polysiloxane	Safe pan glaze.
Sweetening agents	
Dulcin	Caused liver cancer in animals at dose levels of 0.1%; retarded growth at 0.5-1.0%.
P-4000 (1-propoxy-2-amino-4-nitrobenzene)	Damaged kidneys and retarded growth in animals at 0.5-1.0% dose levels.
Saccharin	Only slight retardation of growth at 5% dose levels.
Sodium cyclohexyl sulfamate	do.
Thickeners	
Carboxymethyl cellulose	Not absorbed from intestine of rats when fed at very high levels.
Methyl cellulose	do.
Wax Additives	
Acetaldehyde	May be added to wax emulsions to prevent fruit spoilage.
Aldol	do.
Boric acid	Not allowed in wax emulsions for use on fruit.
Dehydroacetic acid	do.
Diphenyl	Opinion withheld.
p-Hydroxy benzoic acid esters ²	do.
Morpholine	May be added to wax emulsions to prevent fruit spoilage.
Parafomaldehyde	Not allowed in wax emulsions for use on fruit.
o-Phenyl sodium phenate	May possibly be used in wax emulsions.
Sodium tetraborate	Not allowed in wax emulsions for use on fruit.
Triethanolamine	May be added to wax emulsions to prevent fruit spoilage.
Wetting Agents	
Alkyl aryl sulfates	Moderately toxic. May be used to wash fruits if followed by adequate rinsing.
Alkyl aryl sulfonates	do.
Quaternary ammonium salts	Unsafe.
Roccal	Unsafe.
Miscellaneous	
Calcium soaps	Safe stabilizers for plastic food wrappers.
Dinitro pesticides	Dinitro-o-cresol, for example; metabolic stimulants, also produce cataracts.
Diphenyl-p-phenylene diamine	Safe for preserving vitamin content of alfalfa seeds.
Quilon	Safe water-repellent for wrapping papers.

2. Methyl, ethyl, propyl, and butyl.

advisory council are to consult with the National Science Foundation, Research and Development Board, and the three military services in setting up the unit. Secretary of the Air Force is the managing agent, will appoint the director. Research and Development Board will primarily guide policy.

ASTIA will be the well from which military contractors can draw needed technical information. Its job is to collect, index, catalog and store scientific and technical reports from the military departments, their contractors, and non-military domestic and foreign sources. Moreover, it must prepare and distribute digests and abstracts of these reports to qualified groups.

One of the new agency's prime objectives will be the elimination of wasteful duplication in the collection of technical reports for the military. Typical example: Navy's reports section at the Library of Congress, now stacks up Army and Air Force reports in addition to its own.

Location of headquarters for ASTIA is still to be decided, but—to guard against cries of favoritism—it's a good bet that neither Wright Field nor Library of Congress will be picked.

FDA Reshuffled

"A truth campaign" and "vigorous enforcement" were the promises of Charles W. Crawford as he was sworn in as Commissioner of Food and Drugs (CIW, May 26). Crawford points out that the primary function of the FDA is to protect the consumer from substandard, harmful, or fraudulent products.

"Our task is lightened by the fact that the greater majority of producers consistently comply with the spirit and the letter of the law," he says. "But human errors occur in the best run plants and there is always an unscrupulous fringe to every industry which disregards the interests of the consumer."

Before he could start any campaign

to root out the frauds or clamp down on the errors, however, Crawford had to reorganize his own FDA higher echelons (KEY CHANGES, *this issue*). The chain reaction was caused in part by his own elevation to the post of Commissioner (leaving an opening for Associate Commissioner) and in part by the retirement of Louis Elliot, after 38 years of service.

Now, surrounded by a capable group of long-time career employees in new key positions, Crawford can carry on his truth-enforcement campaign.



"Scotty" Hits The Road

A novel device to boost public relations and employee relations simultaneously will be introduced by Minnesota Mining and Manufacturing Company this summer. The device: A windshield "sticker" for employees' cars that will serve to identify employees to their fellows and at the same time make the public more 3M conscious.

The cartoon-type sticker, which bears the smiling face of a small scottish gent, bears the caption, "Hi-ya Scotty." There is no commercial copy on the emblem. Only ad tie-in is the fact that the plaid of Scotty's cap is identical with the plaid used on packages of Scotch tape, the company's most widely known product.

Company officials claim that about 9,500 employees of 3M will decorate their cars and luggage with the emblem as they embark on summer vacations. As an added incentive to the development of company esprit de corps, 3M will award a prize each month to vacationing employees who meet farthest from their home cities. Only conditions are that both be on vacation, be away from the cities in which they live, and not have been acquainted prior to "Scotty's" introduction.



INFORMATION PLEASE: Employees get details of new plan that establishes . . .

Pensions Geared To H. C. L.

Monsanto employees had better like their new pension plan. Why? They practically wrote it.

It was suggestions from the rank and file of Monsanto employees that provided the basis for the new plan which aims to bring retirement benefits more in line with current living costs. The previous plan, in effect since 1940, had the fault of many industrial pension programs: It overlooked the fact that the purchasing power of a greenback has a nasty habit of varying all over the lot.

The new plan, however, seeks to remedy this situation by basing benefit calculations on the earnings received by the employee just prior to retirement rather than on the average earnings received over his entire tenure of employment. In addition, military pensions do not reduce retirement benefits.

Two Parts: Actually the plan is divided into two parts, non-contributory and contributory. The non-contributory arrangement based upon salary and years of service, gives a minimum pension of \$120. The contributory setup, on the other hand, takes up where social security leaves off and accumulates additional benefits toward retirement on all yearly earnings over \$3600.

Normal Retirement: Twenty five or more years of service upon reaching the age of 65, entitles an employee to a pension of \$120 a month up. And under the new plan years of service are counted from date of hire,

not as previously—from the age of 30. Pension benefits are based on the average earnings during the ten years prior to retirement. Significantly, the entire salary is taken into consideration in the computations, not just the first \$3000 as was formerly the practice.

Contributory Plan: In addition to these benefits, employees over 30 years old and earning more than \$3600 may authorize company deductions of 4½ percent of the amount of their salary over \$3600 for placement in a trust fund. The company contributes the balance necessary to guarantee retirement payments in accord with the plan.

Upon retirement, the employee receives these benefits in addition to those from the non-contributory plan. Figurewise, it works out that each year after retirement the employee will get back ⅓ of his total contributions . . . which means that after three years Monsanto foots the bill completely.

Disability: The new plan also includes a disability feature which provides for a disability retirement benefit for employees becoming totally or permanently disabled before age 65. The only requirements are that the employee have 15 years of service and be able to give medical evidence of total and permanent disability preventing gainful occupation. The only exceptions to disability coverage are when the disablement is due to alcoholism, narcotic addiction, a willful

act and military or warfare disablement. Disability benefits continue to age 65, when they are replaced by the retirement payments.

Early Quits: The plan also contains provisions to permit retirement at ages less than 65. Retirement at 55-60, however, requires company consent or option before the benefits may be paid out. But retirement in the age range 60-65 requires no company consent and may be at the option of the employee or the company.

There's no doubt the plan has made a unique attack on the old problem of how to grow old gracefully in industry. But its main contribution is that it makes a noble attempt to keep the purchasing power of the retirement income somewhere in line with that of the employment income. And in these days that's quite a trick.

FOREIGN

Australia: Imperial Chemical Industries of Australia and New Zealand (ICI/ANZ) will spend approximately \$6.75 million in the next three years to bolster Australian production of polyvinyl chloride. Output of ICI/ANZ's Botany plant (near Sydney) now runs about 1,000 tons a year; this will be stepped up to 6,000 tons. At the same time, the company plans to push production of caustic soda to get more chlorine for production of the plastic.

Brazil: Importation of 300,000 tons of chemical fertilizer before fall has been decided on by government officials to aid the country's agricultural industry. To speed imports, the Banco do Brasil has promised immediate exchange coverage, has also promised to permit payment of freight charges in dollars. The value of imports plus freight charges is expected to reach \$16 million, most of it going to American suppliers.

EXPANSION

Morgantown Ordnance Works: Bids for leasing have been submitted by three companies: Solvay Process Division, Mathieson Chemical, and Sharon Steel Corp. Heyden and United Distillers did not make formal bids but suggested bases for negotiating leases. Plant is equipped to produce ammonia, formaldehyde, hexamine, and ethylurea.

AEC: Final negotiations are now underway for obtaining full title to the land site on the Commission's \$45 million project in Colorado. Construction on temporary structures began in

mid-May, work on permanent buildings will begin shortly. First permanent construction work will be on a secret process building. Administrative and supporting structures will follow. A cost break-down shows: \$30 million will be spent on facilities, \$15 million on land, engineering fees, and other costs.

KEY CHANGES. .

George P. Larrick: From associate commissioner to deputy commissioner, FDA.

John L. Harvey: From director of regulatory management to associate commissioner, FDA.

Kenneth L. Milstead: From chief of Cincinnati district to director of regulatory management, FDA.

Chester T. Hubble: From chief of Minneapolis district to chief of Cincinnati district, FDA.

F. Leslie Hart: From chief chemist, Boston, to chief, Boston district, FDA.

Maurice P. Kerr: From chief inspector, New York, to chief, Minneapolis district, FDA.

Stanley A. Thompson: To manager, Special Oils Technical Service Department, Archer-Daniels-Midland.



NO WORK: Pickets have nothing to do in 100 per cent effective strike.

Same Demands, New Place

Early this week, anything but brotherly love was flowing in the city famed for same. Employees (2300) of the six plants of Publiker Industries, Inc., were still out on strike and discussion of the issues involved continued at an intense level.

Principal parties in the negotiations

were representatives of Local 263, CIO Distilling Workers of America and John Sears—former head of the Philadelphia office of the FBI—who is now industrial relations chief at Publiker.

Issues: The main demands of the union included a pension plan, pay raise and improvement of working conditions. And all Philadelphia plants of the company, including the Publiker Barrel factory at Marcus Hook, Pa., remained closed. Negotiations continued with a Federal Mediator sitting in to aid and abet the possible landing of a dove of labor peace.

A spokesman for the company admitted the strike is 100 percent effective. This was borne out by the very light picketing of the plants. Even the company's home office entrance was patrolled by only a token picket force.

Negotiation: M. H. Goldstein, counsel for the union, pointed out that the strike has been in the hands of Federal conciliators for weeks. The union, he claimed, is ready to accept a smaller wage increase than originally demanded. And the company too, apparently, scaled up its offer.

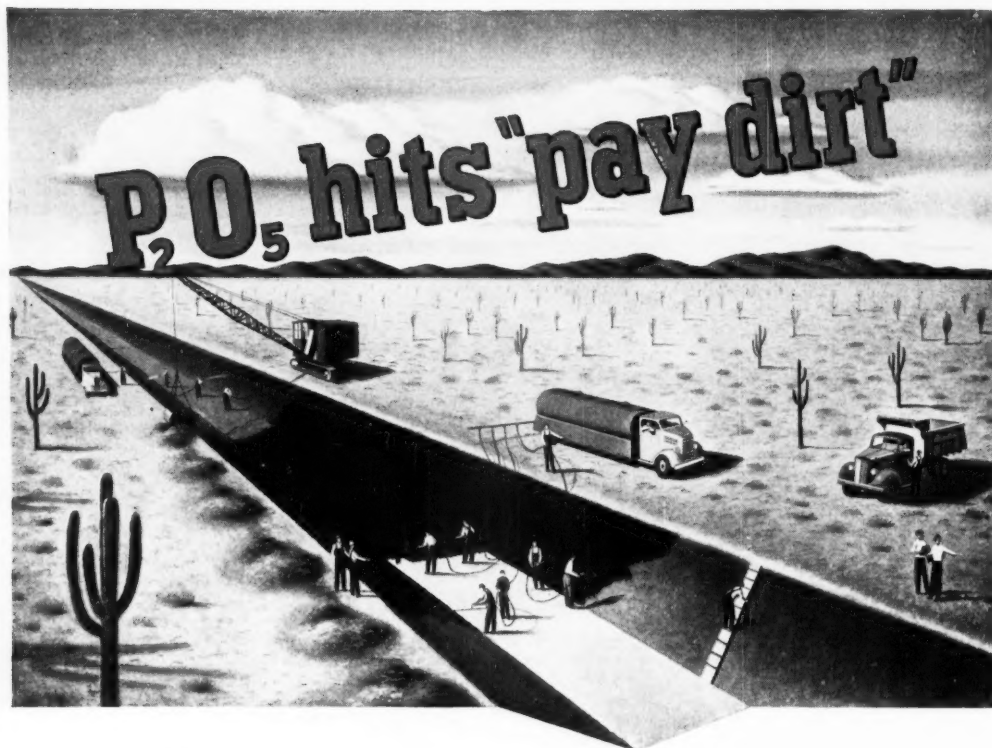
Worry: The management was concerned by the stoppage of production. A steady flow of orders is eating up the stocks on hand of brand whiskies and industrial alcohol. And the orders continue to roll in. But many veteran observers feel that long before the last barrel is shipped, peace will reign at Publiker.

GOVERNMENT NEEDS

Bid Closing	Invitation No.	Quantity	Item
General Services Administration, Region 1, 620 Post Office and Court House, Boston, Mass.:			
July 5	BO-W-86-51	Over 3,000 gals.	paint and enamel
Watertown Arsenal, Watertown, Mass.:			
July 5	259	200 carboys	macor etching acid
Purchasing Officer, Bureau of Engraving and Printing, Washington, D.C.:			
July 3	BEP-474	24,000 lbs.	ground gelatin glue for sizing

GOVERNMENT AWARDS

Item	Supplier	Location
Chemical Corps Procurement District, 111 E. 16 St., New York, N.Y.:		
zinc oxide, grade 1, class A	Eagle-Picker Sales Co.	Cincinnati, Ohio
antiset dye (green, for colored smoke mixture)	American Zinc Sales Co.	Columbus, Ohio
auramine hydrochloride (for colored smoke mixture)	City Chemical Corp.	New York, N.Y.
dye, (red, for colored smoke mixture)	Harmon Color Works	Haledon, N.J.
	E. I. DuPont	Wilmington, Del.
Raritan Arsenal, Metuchen, N.J.:		
desiccant, (activated type V)	The Davison Chemical Corp.	Baltimore, Md.
caustic soda	Buckeye Soda Co.	Painesville, Ohio
engine oil	Victory Oil Co.	Philadelphia, Pa.
	U. B. Bray Co.	Los Angeles, Cal.
Headquarters, Air Materiel Command, Wright-Patterson Air Base, Dayton, Ohio:		
plastic sheets	Rohm & Haas Co.	Philadelphia, Pa.
	Celanese Corp. of America	New York, N.Y.
Federal Supply Service, GSA, Region 3, Washington, D.C.:		
sodium sulfite (anhydrous, photographic)	Philip A. Hunt Co.	Palisades Park, N.J.
sodium thiosulfate	not given	
Federal Supply Service, GSA, Cleveland, Ohio:		
paint	Fr�y-Yenkin Paint Co.	Columbus, Ohio



Petroleum Industry Benefits from Use of Victor Chemical—Victor phosphoric anhydride is being used profitably as a catalyst in the preparation of asphalt for large irrigation ditches. The P_2O_5 eliminates softening at high temperatures, prevents brittleness during low temperatures, and saves costly replacement or repairs.

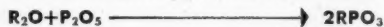
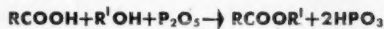
This new catalytic type asphalt also provides additional benefits. Now it is possible to increase irrigation and reclaim arid land which previously was impractical due to high construction costs.

You, too, may find the answer to an unusual product problem with highly reactive Victor phosphoric anhydride. P_2O_5 and other versatile Victor chemicals merit your consideration. Please write for technical data or other information, on your company letterhead.

Other applications in which Victor phosphoric anhydride has proved useful

- **GAS DRYING AGENT**
- **REAGENT IN METHYL METHACRYLATE RESINS**
- **PRODUCTION OF ORGANIC PHOSPHATES**

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RESEARCH



AUTOMOBILE FINISH: Peroxide reduction equals gloss reduction.

Reduction Dulls Finish

General Motors researchers peg moisture as a major factor in paint, lacquer, and enamel failure.

Peroxide formation appears to be the actual chemical cause, but strangely enough . . .

Reduction, not oxidation, is the probable mechanism.

Why does a painted metal finish lose its luster with age? This seemingly innocuous question has been a perennial chemical puzzler. In the automotive industry, it is more than academic; dollar and cents implications are obvious. This week, Ralph J. Wirshing, head of the General Chemistry Department at General Motors Research Laboratories, thinks he has the answer.

According to Wirshing, moisture is the villain. On the surface, this observation is not very startling. But Wirshing has a new twist that should be an eye-opener. His work indicates—in apparent contradiction to accepted theory—that chemical reduction, not oxidation, is to blame for eventual dulling and chalking of shiny paint finishes.

A series of interesting experiments, topping off eleven years of research, gave the clue. GM researchers exposed auto finishes on a 10,000-foot mountain at a Smithsonian Institute Weather Station near Montezuma, Chile. In the dry sunshine, sample panels of lacquers and enamels showed hardly any dullness or chalking.

However, the opposite was true of similar panels exposed the same length of time in the warm, moist climate of Miami, Fla.

To get at the heart of the problem, researchers constructed special aluminum cups with circular window tops. Paint samples were sealed in, and moisture content adjusted; containers were then exposed to the rays of the sun for vary periods of time. Two sets of cups, each containing one cc of water, exploded.

From previous experiments (on an entirely unrelated problem) Wirshing knew that light acting on zinc oxide, in the presence of moisture, caused the formation of peroxides. He therefore attributed the paint explosions to peroxide formation. Now a working theory could be formulated. It would be logical to assume that some constituent of paint or lacquer was oxidized to form a chalk over the auto finish, much in the same way as rust coats iron.

Although this explanation appeared plausible on the weight of experimental evidence, it was to be completely demolished. Subsequent tests showed

that enamel and lacquer films subjected to hydrogen peroxide alone didn't dull or chalk any faster. Wirshing still felt that peroxide was the key to the riddle.

If peroxide doesn't oxidize, it might reduce. Hydrogen peroxide, under favorable conditions, can reverse its usual behavior and function as a reducing agent. One of the essential conditions is moisture. Both outdoors and in the laboratory, enamel surfaces dulled and chalked in a matter of minutes when moisture or a wetting agent was applied to test panels.

General Motors believes this work—by spotting chemical reduction as a causative factor—has laid the foundation for new advances into the mechanism of paint and lacquer deterioration. Wirshing, understandably cautious, states “. . . a forward step has been taken in our study of paint failure, and while our theory as to why may not be correct, the [experimental] differences we have produced are very apparent.”

Germ Gusher

Bacteria may one day provide the means for rejuvenating exhausted oil fields. That's the hope fostered by the results of a decade of research into the relation of bacteria to petroleum formation.

Mentor of this intriguing program, Claude E. Zobell, Professor of Marine Microbe Biology at the University of California's Scripps Institute of Oceanography, has discovered that some bacteria can release oil from sand, limestone, and porous rocks.

Several theories have been advanced to explain this phenomenon. Bacteria either push the oil off grains of sand by pure physical means, or they react with the surrounding matrix to yield a wetting agent which breaks the oil's grip. Certain bacteria found in limestone produce acids which dissolve the mineral and release trapped oil. Still other microorganisms synthesize methane which is taken up by oil. Result is a less viscous, more easily extracted product.

One obvious question is whether bacteria can live deep in oil-bearing formations? Zobell has apparently found they can. He has recovered many oil-valuable species from well brines.

More Than Before: When an oil field goes dry, much oil remains trapped in subterranean rocks and sands. Surface tension is the primary

RESEARCH

force holding a great deal of this unavailable petroleum in its sandy bed. If this force can be broken, a tremendous amount of oil could be recovered from long abandoned fields. It is possible these fields could even top their former productive peaks.

Enter Fiber E

Fiber E, Du Pont's newest cellulose fiber, is now in limited commercial production at Old Hickory, Tenn. Although it's a viscose process rayon, **Fiber E** differs in several aspects from more familiar types.

On cursory inspection, a spool of the new fiber is almost indistinguishable from one of conventional viscose rayon. Nevertheless, physical properties differ sharply. **Fiber E** has at least ten times the abrasion resistance of more popular materials. Moreover, there is no crimp to the raw yarn.

The textile processor buys a straight, smooth yarn which he may convert to a curly, wool-like fiber by soaking in dilute caustic soda. This transformation works equally well with the woven fabric. After adequate washing, the fabric is ready for dyeing and finishing.

Du Pont says **Fiber E**'s crimp-taking ability is the result of special spinning techniques and a special chemical formulation in the viscose coagulation bath. At any rate, the fiber may be woven into fabrics ranging from soft suede to considerably rougher surfaces. Final effect depends on yarn filament size, pile height, fiber density, and concentration of the caustic processing solution.

One Bath, Two Tones: Fabric designers are using **Fiber E** alone and in combination with regular viscose process rayon to get unusual color and surface contrasts. Combined with other fibers, it gives a carved effect to cut, brushed, and loop-pile fabrics and produces a two-tone color from a single dye bath.

Austrian Revival: Donau-Chemie A.G. of Vienna has started production of several new chemical products. Most important: L54, low-boiling solvent for fats, oils, waxes, pitch, rubber, and polyvinyl chloride. May also be used in foodstuff extraction processes. Other new products include carbon tetrachloride, perchloroethylene, and anesthetic trichloroethylene.

Cortisone Advance: By a new procedure developed by Harvard's Fieser, Herz, and Huang, natural steroids from yeast, wool fat and the Mexican

yam take up oxygen at points in their molecules to give substances from which cortisone can be made. Starting steroids have no functional groups in the crucial molecular positions.

Pyridine Process: Shell Development Co. has patented (U. S. 2,528,978) a vapor-phase reaction of an alkoxydihydropyran and ammonia (at 300-500°C in the presence of a dehydrogenation catalyst) to yield pyridine. Alkylated pyridines are formed by using proper unsubstituted dihydropyran ethers.

B₁₂ Boost: Conversion of vitamin B₁₂-like substances to the vitamin is facilitated by treatment with cyanide. Cyanide treatment also boosts microorganism output of the vitamin. Merck researchers—using cyanide—obtained a three-fold increase over routine methods.

Fungicidal Quats: According to U.S. Patent 2,520,902, quaternary ammonium compounds of 1-dodecyl-2-aminopyridinium chloride with various substituted haloamines give salts which form water-soluble copper complexes. Products are good fungicides, form no curd in hard water.

Sparks Research: Dow Chemical Co. has granted the University of Texas \$10,000 to help finance research on production of acetylene from natural

gas by an electric discharge process. State and private industry have put up nearly \$200,000 thus far, to further the process for gas-rich areas. Filor-plant has been operating since June, 1950.

Muscle Relaxer: Mytolon, a new synthetic drug, may obviate the need for deep anesthesia in surgery requiring muscle relaxation. A curare-like agent, Mytolon is safer and more potent than natural curare. Chemically 2, 5-bis-(3-diethylaminopropylamino)-benzoquinone-bis-benzylchloride, the drug was developed by Sterling-Winthrop Research Institute.

New Plasticizers: Class of carbamate esters having low volatility, low water-solubility, and good compatibility with cellulose esters, ethers, and the vinyl resins has been patented by Pittsburgh Plate Glass Co. Suitable for plasticizers, the compounds are diester amides of a secondary amine and a polyglycol bis (acid carbonate).

Forest To-Be: Success of European experiments in obtaining good-quality cellulose from eucalyptus and casuarina woods has prompted the Egyptian Ministry of Commerce and Industry to undertake a vast program of forestation. Objective: To protect Egypt's artificial silk and paper industries from shortages on the world market.

Bacterial Enzyme Yields New Drug

Lederle Laboratories Division of American Cyanamid Co. has pioneered the development of a drug that dissolves dead tissue. A combination of the enzymes streptokinase and streptodornase, the product is derived from streptococcus bacteria.

Major share of credit belongs to Lederle's Frank Ablondi who found the right germ for the job. Many types of strep bugs produce the two enzymes, usually in micro quantities, but only Ablondi's Group C produce in bulk. These obliging microorganisms have now been put to work in a commercial fermentation process.

The new drug answers to the name Varidase. Its ability to make short work of dead tissue makes it useful in surgery, skin grafting, and the treatment of osteomyelitis, tuberculous abscesses, infected wounds, severe burns, etc. Additional clinical investigation is now in progress.

As a sideline to its primary function, Varidase is valuable in clearing the way for attack by conventional



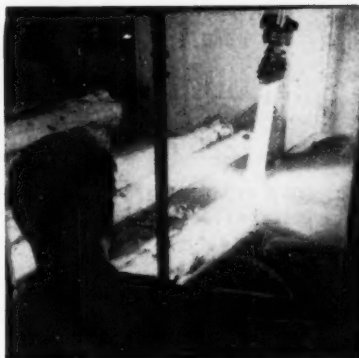
FRANK ABLONDI: Group C obliged.

therapeutics. Despite its disintegrating action on pus, blood clots, and other dead tissue, the drug is apparently harmless to living cells.

PRODUCTION



1 LOGS are cut at Khuzeymateen Inlet, 65 miles from Prince Rupert, floated to the plant and there cut into 20-foot lengths.



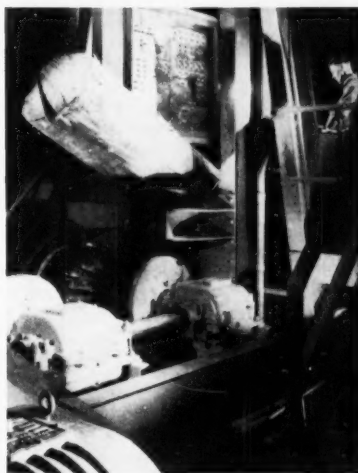
2 BARK is removed without wood loss by a hydraulic barker.

Modern Cellulose Plant: First Step to Acetate

Dissolving pulp from the recently-completed plant of Columbia Cellulose Co., Ltd., a subsidiary of Celanese Corp. of America, will go far to alleviate the present acute shortage of this material for the manufacture of cellulose-derived fibers and plastics.

The new plant represents the latest step in a long-term program of vertical integration by Celanese. The company now has plants, not only to manufacture its major product, cellulose acetate fibers, but for production of the necessary raw materials, cellulose, acetic acid and acetone. The latter products are provided by the direct oxidation of LPG hydrocarbons at Chemcel, Texas. Acetic anhydride, required for acetylation of the cellulose, is derived by dehydration of acetic acid at the spinning plants.

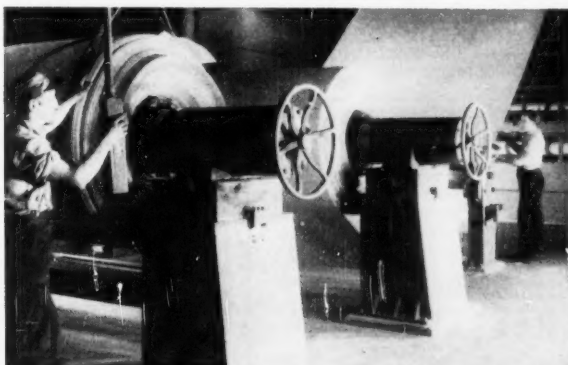
Although most of the product of the new plant will at first be exported, a part of the mill's output will eventually be consumed in Canada for producing filament yarn and staple fiber for the Canadian textile industry. To supply the needed acetic acid and acetone, the Celanese process for hydrocarbon oxidation is being installed in a new plant of the company being built in Alberta.



3 NEXT the log is chewed into small chips to facilitate digestion.



4 CHIPS move to digester to separate lignin by a calcium bisulfite cook.



5 PULP from the digesters is gathered, washed and the sheet of pulp dried before winding on rolls for storage.

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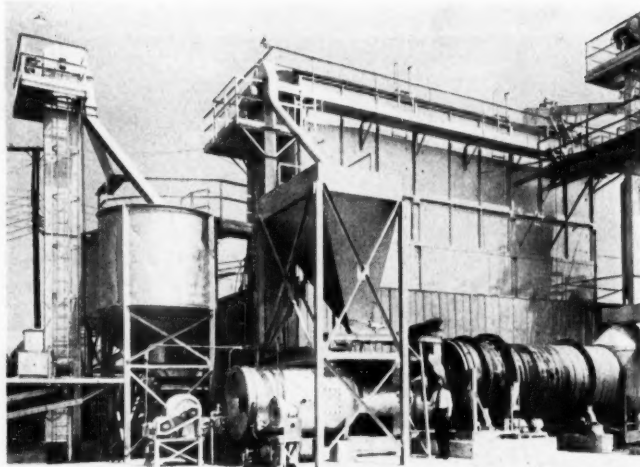
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PRODUCTION



More Silica Gel In California

OUTDOOR DRYING BASINS are used for the manufacture of silica gel in the new plant of Culligan Zeolite Co., at San Bernardino, California. Over three million pounds of gel are being produced per year.

The first step is the reaction of sodium silicate with sulfuric acid. The gel pro-

duced by this reaction is then dehydrated. Culligan, in contrast to usual practice of using fuel-derived heat, drives the gel in outdoor drying basins, originally developed by Culligan for drying zeolites. Activation of the gel is carried out by heating to 1,000 F in a Link-Belt roto-louvre dryer.

Corp. has developed a series of asbestos-neoprene formulations that are highly resistant to oil, water and gasoline. They are supplied in thicknesses ranging from 0.031-0.125"; 300 F is the maximum working temperature.

Leak Detector: The ability of certain materials to fluoresce when exposed to rays from carbon or mercury arc lamps is being put to use in a new leak detector marketed by George W. Gates & Co. To determine the location of a leak a small quantity of a fluorescing agent is dissolved in the material in the vessel to be tested. Any flow through the wall of the vessel can be spotted immediately when irradiated by the battery-powered blacklight source.

Foam for Polar Liquids: A new mechanical type foam-producing liquid is being marketed by National Foam System, Inc. for smothering fires involving either petroleum solvents or such polar solvents as alcohols, esters or ketones. The liquid is non-corrosive, flows freely at temperatures as low as 10 F. Even if frozen it is effective after thawing.

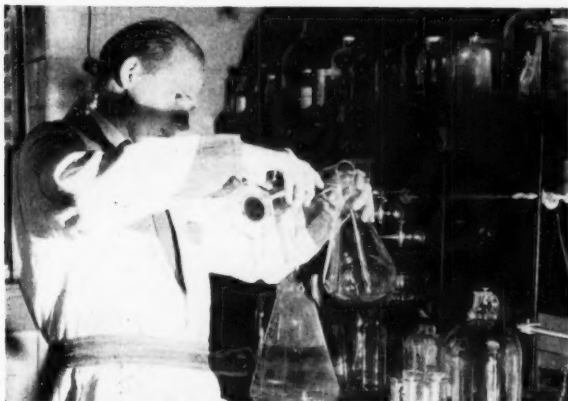
Miniature Instruments: To reduce the

space occupied by control instruments for process equipment Bailey Meter Co. has introduced the new Mini-Line instruments. The company states that centralized control panels using this type of instrument will be more than 50% smaller than any previously available. The new multi-point indicator uses 87% less space than the standard; the selector valve 52% less; the remote manual relay 70% less.

Thermostat: Smith Control & Instrument Corp.'s new expanding tube thermostat can measure temperatures up to 600 F with a sensitivity of ± 0.2 F. A stainless steel tube, also used as the cover, serves as the expanding member. An Invar strip inside the stainless tube is the non-expanding member. Fast make and break is provided by an Inconel spring. An adjusting screw provides quick and easy setting of the control point.

Radiation Survey Meter: A new portable radiation survey meter of improved stability is being manufactured by Tracerlab, Inc., for measuring beta and gamma rays in "hot" laboratories. Three scale ranges, 15, 150 and 1500 mr/hr. are provided.

SPECIALTIES



1 BOB SMITH-JOHANNSEN, chemist at GE's Waterford, N.Y., silicone plant, mixes batch of primer in search for silicone rubber bonding agent.



2 PRIMER is swabbed on metal, allowed to air dry for few minutes in test run.

Silicone Rubber Bonded Now to Metal, Ceramics

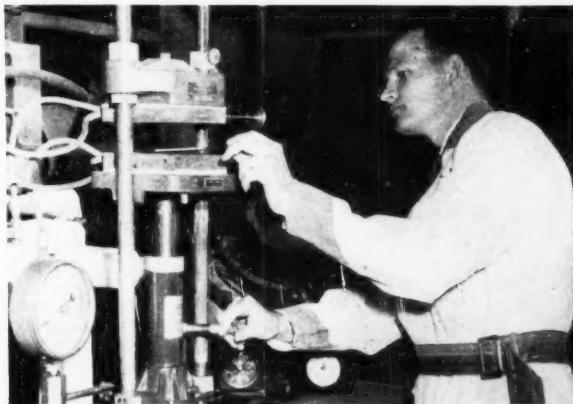
A General Electric Co. chemist with a life-long interest in how and why things stick has developed a material which permits bonding of silicone rubber to almost any surface—metals, glass and ceramics. He's young (33) Bob Smith-Johannsen, skiing enthusiast and champion as well as scientist. His discovery: G-E 81267 primer (*CIW*, May 5).

Smith-Johannsen began delving into principles of adhesion when, as a Montreal schoolboy, he was bothered by ice on the bottom of his skis. While earning a B.S. in chemistry at McGill University, he made extra money formulating ski wax; and he continued research on such products during graduate work at the University of Oslo, Norway. In 1944, he came up with ski wax of promise in de-icing airplanes. GE's Irving Langmuir heard of it and soon the skier-chemist was working on the airplane wax at GE. It's now being evaluated.

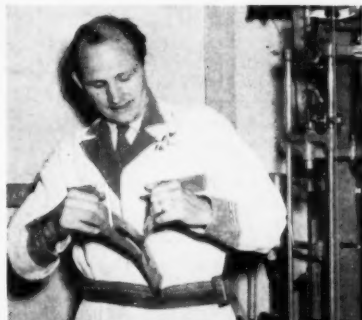
His latest invention is somewhat of a switch for him in that it promotes, rather than prevents, adhesion. But GE's happy, for the primer makes possible such silicone rubber-to-metal products as shock and engine mounts that resist both high and low temperatures.



3 SILICONE RUBBER between two pieces of primed metal makes test sandwich.



4 TREATMENT subsequent to priming is important to strength of bond. He finds pressing sandwich at 125 C for 20 minutes does the job.



5 BOND formed by new primer, too much for inventor, is stronger than the rubber.



RIFLE BOOT: With VPI, no grease to clean.

Vapor Corrosion Control

Military services are on the way to replacing grease with chemically impregnated paper and cardboard in packing rifles, other ferrous equipment.

A volatile corrosion inhibitor permeates the package, renders moisture non-corrosive. Chief advantage: No "goo" to apply, or remove prior to use; saves time, money.

A Government specification (MIL-P-3420) for packaging materials treated with volatile corrosion inhibitors is the most recent indication that the military services consider such chemically impregnated wrappings worthy competitors of grease-type rust inhibitors. No papers have been approved yet, nor has testing begun, although that should not be more than a few weeks off. When it does begin, a fairly long line should be formed, as a number of paper outfits and chemical companies specializing in rust preventives have a big stake in the business.

The specification contains a year-long test provision, but that is expected to be waived. And Shell Development Co., which has patents on one of the principal volatile inhibitors, thinks the spec may be interpreted to approve its material on the basis of performance tests already passed.

Shell's VPI 260*—vapor phase inhibitor—(CI, Oct. 1948) is dicyclohexylamine nitrite, a white crystalline material which sublimates to form an invisible shield for steel or aluminum

drop. (It has a deleterious effect on zinc, magnesium, cadmium, is no good for silver, copper.) The material, in depositing on the metal, passivates it, render moisture non-corrosive.

Who's in VPI: Among companies licensed to produce VPI papers and cardboard are American Reinforced Paper (Attleboro, Mass.), Angier Corp. (Framingham, Mass.), Excello Paper Products (Cincinnati), Hinde & Dauch Paper (Sandusky, O.), Marvellum (Holyoke, Mass.), Miami Valley Coated Paper (Franklin, O.), Orchard Paper (St. Louis), Sisalkraft (affiliated with American Reinforced, Chicago), and Canada Glazed Paper (Montreal). Dearborn Chemical (Chicago), one of the big names in military packaging, has its paper made by Marvellum, sells it as Dearborn VPI.

Most of the board has been going into small cartons, folding and setup boxes for such things as spark plugs and fuel pumps headed for inventory. Paper has been used for overwraps, case liners and interleaf applications. Springfield Arsenal* has been using

rifle "boots" (see cut) made of VPI paper, and the Canadian Arsenal recently ordered 60,000.

Other VCI's: Another big Chicago rust preventive formulator, Nox-Rust Chemical, has its own VCI (Army-use for volatile corrosion inhibitor) paper called Kallex. This contains 1 gram of sodium nitrite and 1 gram of urea per sq. ft. (U. S. P. 2,521,313). Nox-Rust explains that these materials react with moisture to form ammonium nitrite which volatilizes onto the metal surface, protecting it by passivation.

Cromwell Paper (also Chicago) has another patented process for coating paper with a volatile inhibitor. Its tradename is Ferro-pak; product "is based on an amine", but has other ingredients the company won't identify.

Sodium benzoate is the active ingredient in Thilco Tri, entry of Thilmany Paper (Chicago) which is not on the market at present because the company has been too busy working on other wraps for military applications to proceed with market development. This compound was used by the British aircraft industry in the war.

Army View: Various military groups have been investigating volatile corrosion inhibitors for the preservation of ordnance items, and Ordnance experts have recommended dicyclohexylamine nitrite or its equivalent be substituted for present packaging mediums, chiefly for ferrous metals.

The operation is simple—a clean weapon is placed in a treated wrapper and the package sealed. This saves time over usual packing.

The vapor inhibitor penetrates the package to the smallest parts with its protective film. It's almost impossible to coat every part with conventional preservatives.

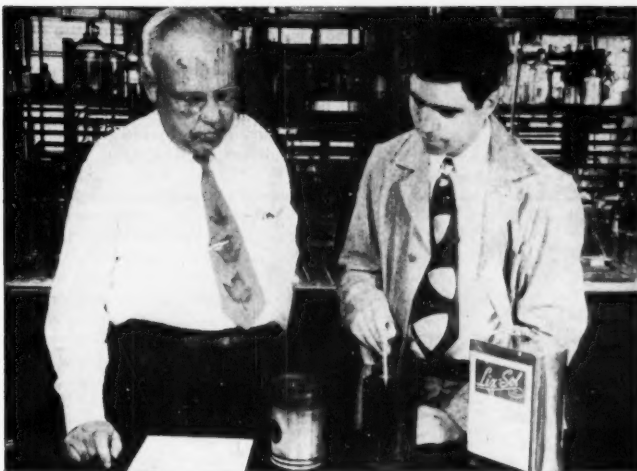
There's no grease to be removed. Ordinarily, cleaning rifles with a wire brush and solvent is a time-eater, and small parts are often lost, putting weapon out of use until replacements are obtained.

Even when the package is broken, the vapor continues to prevent corrosion. Sealing isn't actually required.

Limitations: Although these new corrosion inhibitors can be used to great advantage by the military as well as civilian manufacturers, they do have some limitations. Most of these materials are water-soluble, can be leached out by rain. This leaves barrier papers and plastic webs (both often used in combination with silica gel) still in a strong position for severe storage conditions. The VCI wraps, however, can be given a simple wax coating to increase their utility.

* Process for coating paper with casein binder and VPI 260 is referred to as VPI 290. VPI 220 is diisopropylamine nitrite; in crystal form it protects cylinders of airplane motors "on standby", preserves industrial drums.

* Each arsenal can use up to \$500 worth of non-spec materials, and they often re-order.



COPAS AND GADBERRY: Salesman-chemist specialties team.

Cleaning Tandem

Salesman's curiosity about railroad maintenance chemicals leads him to research institute. Result: small specialties outfit with cleaner for diesels, new one for electrical motors.

When Trans-World Airlines begins cleaning the curtains and seats of its planes with a new fabric cleaner this month, Lix Corp., small Kansas City, Mo., specialties company, will be able to add a paragraph to the sales story for its electrical motor cleaning solvent. For the airline will be using Lix's solvent cleaner, a product formulated especially for electrical motors. This material gave such good results in removing grease and grime from electrical equipment that TWA tested it on fabric, liked it, promptly made a fabric cleaner out of the motor degreaser.

The Lix electric motor (and now fabric) cleaner is a formulation of hydrocarbon and chlorinated solvents developed by Midwest Research Institute's Howard Gadberry. In arriving at the mixture, he has tried to capitalize on the solvent power of chlorinated solvents while minimizing their toxicity, to retain the advantages of hydrocarbons while retarding their flammability. It's a joint venture for him and Lix's founder, Harry W. Copas, but not the first to come out of the Institute's technical and research counseling (through chemist Gadberry) of its client.

A Salesman Observes: Their association began back in 1946 when Copas was initiated into the Shriners. Copas, who had been selling lubri-

cating oils to diesel-using railroads and other industrial accounts, thought methods then used to remove carbon from diesels—scraping, washing with alkali solutions, solvents—took too long. He expounded on the subject to another Shriner-to-be, and the fellow referred him to Midwest.

Gadberry was soon busy testing various methods for fast carbon removal. After several months research, he submitted his recommendations in the fall of 1946. Lix Corp. was formed by Copas to put them into practice, and production shortly thereafter began to supply first, the Kansas City Terminal Railroad and later, the Kansas City Southern Lines. Now the majority of the railroad diesel maintenance shops in the area, 47 in all, use the product. One, a diesel pioneer, has cut engine cleanup time from days to less than three hours; gives Lix most of the credit.

Like most makers of formulated products, Lix won't give the composition of the product, describes it as a "clear emulsion of coupled solvents which can be cut with either water or hydrocarbons."

The company is similarly tacit about the second product to come out of the Copas-Gadberry combination, the electrical motor cleaner. Although it contains both chlorinated and flammable hydrocarbon solvents—commonly used by other manufacturers—its vapors are said to be relatively non-toxic and only slightly flammable. Users, in addition to TWA, include many steel mills (U. S. Steel, Republic Steel, Inland Steel) and the Chicago Transit Authority.

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F-128



McGRAW-HILL PUBLICATIONS

SPECIALTIES

Norwich Financing: Norwich Pharmaceutical plans to borrow \$2 million from banking sources to retire its present indebtedness, expand plant facilities, and add to working capital. Indebtedness is now placed at \$750,000, leaving the firm a considerable sum for the planned expansion.

Electrical Competition: Manufacturers of chemical air deodorants have another competitor in the new Westinghouse Electric Odorout bulb which emits ultraviolet radiations of a special wavelength to turn oxygen around the lamp into ozone, an air purifier. This is an improvement over an earlier ozone lamp introduced in 1945. The bulb sells for \$1.30, is said to last 6 months when operated 24 hours a day. Special wall fixtures for the lamps are also available. The lamp is recommended for general household use, offices, etc.

Exemptions Out: Beginning July 1, soap products and garden supplies—fungicides, insecticides fertilizer, etc.—previously exempt from the Florida sales tax, will be taxed at the same rate as other retail products. Agricultural chemicals for use on farms are still exempt.

New Companies: The Canadeo Exterminating Co., recently incorporated at Green Bay, Wis., will sell rodenticides, insecticides and related products as well as offer a complete exterminating service.

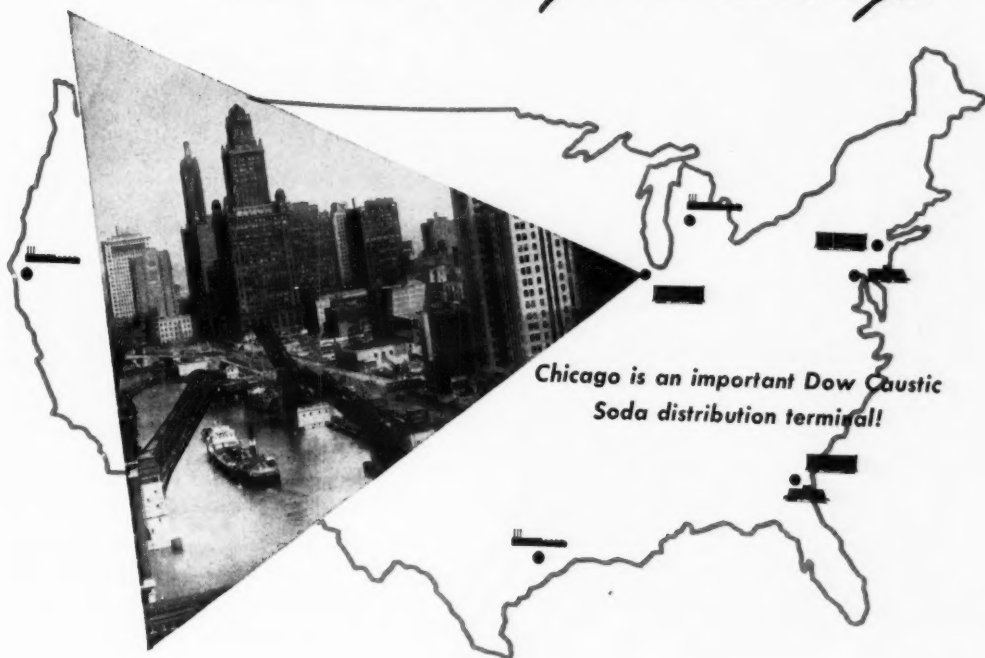
National Products Corp., Raleigh, N.C. has been organized with capital stock of \$100,000 to buy and sell soaps, cleaning fluids, etc.

The Carolina Soap Co., Inc. has begun operations at Pinehurst, N.C. where it is making toilet soaps.

Nox-Rust Expansion: Work has just begun on a new plant in Chicago for Nox-Rust Chemical Corp. which will increase the company's output of rust-preventives and petroleum chemicals 50%. Some of its production facilities are expected to be in operation by early fall.

President Buys: Mason Paint Co., Louisville, up for sale to satisfy a \$187,000 judgment, was bought by its president, William T. Mason, for \$293,000. It will continue to operate under the same management. Under the terms of the sale, \$6,500 is to be paid immediately, one-fifth of the balance on confirmation of the sale, and the rest in four installments over a two-year period.

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As we listen to the latest insults from Moscow, we're likely to get fighting mad.

Instead, we'd better use our heads and get *working* mad.

It is clear by now that Stalin and his gang respect just one thing—strength. Behind the Iron Curtain they've been building a huge fighting machine while we were reducing ours. Now we must rebuild our defenses—*fast*.

As things stand today, there is just *one* way to prevent World War III. That is to re-arm—to become strong—and to stay that way!

This calls for better productivity all along the line. Not just in making guns, tanks and planes, but in turning out civilian goods, too.

Arms must come first. But we must produce arms *at the same time* we produce civilian goods.

We can do this double job if we all work together to turn out more for every hour we work—if we use our ingenuity to step up productivity.

All of us must now make sacrifices for the common good. But we're working for the biggest reward of all—*peace with freedom!*

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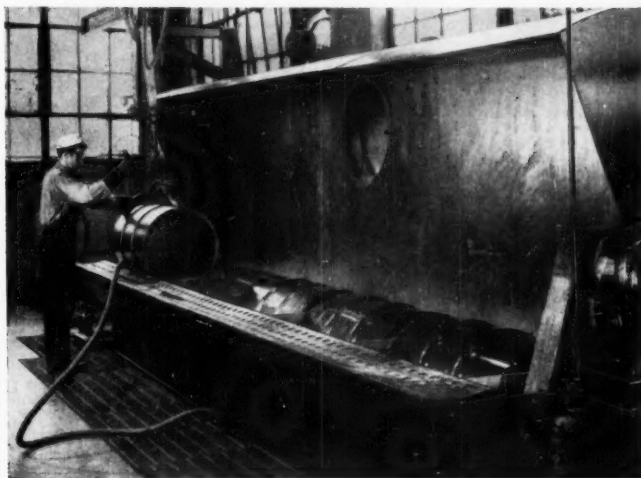
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PACKAGING . . .



FIVE AT A TIME: Hot caustic, steel chains.

More Shipments in Fewer Drums

For chemical manufacturers who are plagued with the shortage of steel drums, an Indianapolis firm offers a partial remedy. Its new drum washer will not, of course, add any drums to the total supply. But it does present an economical, "captive" process for reconditioning drums. And by stepping up the turnover rate of used drums, it effectively increases the manufacturer's drum inventory.

Produced and marketed by the Emerson-Scheuring Tank and Manufacturing Co., Inc., of Indianapolis, Ind., the new power-driven drum washer eliminates the necessity for costly outside service for cleaning large volumes of drums. In addition, it insures a closer control over drum handling which can appreciably lengthen the normal drum life.

Even more significant, however, in these times of container shortages is the speed and convenience of the washer. By eliminating outside washing of his drums the manufacturer can avoid the time-consuming delays in delivery and pick-up. He can also coordinate his drum inventory with his production by a carefully planned cleaning schedule.

Although the entire washing cycle can be handled by one operator, it may be more economical to use a three man team if the work load is heavy. The three man team can clean (and prepare for painting) as many as 160 drums in a single eight-hour shift.

Operation: Cleaning is accomplished by means of a hot solution of caustic soda and short lengths of steel chains. The heavy steel plate tank of the washer holds five drums—two-thirds immersed in the caustic bath that is kept at temperature by steam coils.

Two belt-driven motors rotate the drums in the solution at a rate of 14 RPM. Several short lengths of steel chains, placed inside the drums, combine with the caustic to remove dirt, paint or chemicals.

Drums are fed to the washer and removed by means of an air hoist on an overhead trolley. A contoured drainboard running the length of the washer allows one set of cleaned drums to drain while the operator is loading another set. As a safety factor, a ventilator protects the operator from steam and caustic fumes by drawing the fumes off at the liquid level.

Economies: Preliminary estimates indicate that the whole cost of washing, drying and painting runs about 90¢ per drum. For some manufacturers, this would mean that savings (over the cost of outside service) should pay for the drum washer in about six months. The cost figures were obtained from a process which involved cleaning about 2,500 drums a month. Economies of installing the equipment will vary of course with the cost of outside service and the size of the operation.



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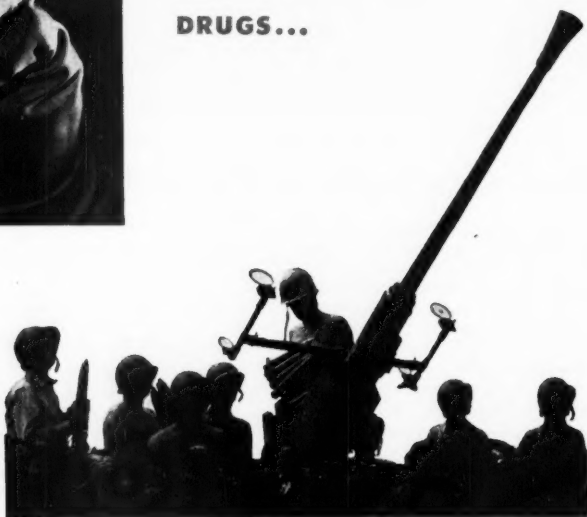
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the SEARCHLIGHT SECTION (Classified Advertising) of **CHEMICAL WEEK** whenever you have personnel problems, wish to sell or purchase used chemical equipment or surplus chemicals. These ads are effective and economical. See page 35 of this issue.

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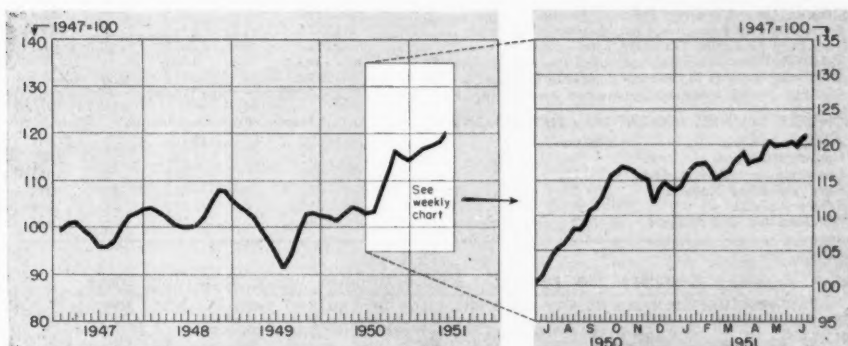
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*By Government authorities responsible for inventory control under the National Defense Act.

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CHEMICAL MARKETS....



CHEMICAL INDUSTRIES OUTPUT INDEX—Basis: Total Man-Hours Worked in Selected Chemical Industries

What effect has the Korean outbreak had on the chemical industry up to now? This first-anniversary query is simply answered in terms of output and price—both strongly up. Now the CW output index is 121, an all-time high, vs. the 103 for the civilian-based level of last June. The current wholesale chemical price index at 142 is a full 27 points above the mark this time last year.

Price levels, however, have been dropping over the past few weeks, (from a February high of 147) now seem to be fairly well stabilized. Chemical output is again beginning to push upward from the plateau it has held for almost six weeks.

New political fissures within the government will slow down the plans of the Office of Price Stabilization for rollbacks under CPR-22. At this writing, a congressional committee in Washington opposes any price rollbacks beyond January, 1951 levels. It seems likely, though, that price advances under CPR-22 will be allowed.

All this adds up the fact that by the end of the year, the price index will be higher, even though maximum ceilings in effect today won't be exceeded by the established producer or jobber.

Supplies of many chemicals are still basically inadequate to cope with a guns-and-butter economy. The National Production Authority has just completed a survey to find which chemicals are short, and by how much. Anyone who buys or tries to buy chemicals can get a copy from the Department of Commerce.

The resale chemical market is usually a good way to find the chemicals in heaviest demand, but this week the keynote is uncertainty. Many resellers are bedevilled by the downward price trend and now the maritime tieup threatens to throttle the flow of needed imports.

MARKET LETTER

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
Chemical Industries Output Index (1947=100)	121.0	121.5	100.7
Bituminous Coal Production (Daily Average, 1000 Tons)	1,717.0	1,648.0	1,727.0
Steel Ingot Production (Thousand Tons)	2,055.0	2,063.0	1,929.0
Wholesale Prices—Chemicals and Allied Products (1926=100)	139.2	140.1	113.9
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	239.7	236.9	191.9
Chemical Process Industries Construction Awards (Eng. News-Record)	\$3,450,000	\$20,595,000	\$15,374,000

MONTHLY BUSINESS INDICATORS—EMPLOYMENT

	Latest Month	Preceding Month	Year Ago
All Manufacturing (Thousands)	12,955	13,104	11,841
Non Durable Goods	5,568	5,666	5,385
Chemicals and Allied Products	529	536	485
Paper and Allied Products	426	427	392
Rubber Products	219	219	194
Petroleum and Coal Products	194	194	177

Resellers are generally less optimistic today regarding trade opportunities than at any time since the first of the year. At least some of the downward price trend of recent weeks is due to a lessening of inventories to improve the ready cash position.

Yet, despite recent improvement in supplies of some previously tight commodities, the position of the spot-buyer in the months ahead won't be much easier.

However, phthalic anhydride is a case of lower resale price, in spite of a tight supply situation. No real improvement is looked for until the end of the year, and even then the naphthalene shortage will call the production tune.

But in today's resale market, phthalic anhydride prices are on a downward slide. The current quotation is 66¢ a pound, off 6¢ from last month's high, but still several pegs above manufacturer's offerings at 20-21¢.

By this time doubts of freer circulation of phenol supplies have probably been dispelled. Buyers at the resale counter find they are getting taken care of with only short delays, paying a shade under 50¢ a pound, fully 10¢ under the price a few weeks ago. Reason: Bakelite's new capacity relieves much of the pressure for plastics buyers.

Alkalis are in a satisfactory state of balance, maintaining the supply improvement of recent weeks. Soda ash can be bought readily, but solid caustic is firm under a keen export demand. For export solid sells for 9½¢, about 1¢ above flake; in the domestic market, flake gets a ½¢ a pound premium over solid.

In most fine chemicals and pharmaceuticals, the squeeze is still on. Three of the most sought-for: citric acid, aspirin, and dihydrostreptomycin. And, if the beef shortage doesn't get straightened out soon, ACTH and other glandulars may go into hiding.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending June 25, 1951

UP

	Change	New Price		Change	New Price
Copra, Pacific ports, ton	\$5.00	\$185.00	Orange Oil, Calif.	\$.25	\$2.50
Coconut Oil, crude, tanks, Pac. ports	.0025	.135			

DOWN

Oiticica Oil, Tankcars	.01	.30	Tin, metal	.05	1.06
Stearic Acid, Double-pressed	.02	.205			

All prices per pound unless quantity is stated.

Sulfur: Enough by '52

Million ton-a-year sulfur deficit will be erased by 1.2 million tons per year of new production.

Nearly half of the new tonnage will come from three new sulfur domes in Louisiana and Texas.

The end of the much-discussed world sulfur shortage is in sight. In fact, it may come to pass as early as the fall of next year.

The current yearly difference between the supply and demand for the yellow chemical staple has been estimated by no less an authority than James Boyd, Director of the Bureau of Mines, to amount to 1 million long tons. But this deficit will be erased by the 1.2 million long tons of costly new capacity which will be added to the industry's 1950 capacity of 11.7

million long tons.

Frasch Maybe: About 40% of the scheduled additional capacity will employ the time honored Frasch process. Typical of this segment of the expansion drive is the fact that Jefferson Lake Sulphur Company has just started production at Stark's Dome in Texas.

But unfortunately, the use of the Frasch process sometimes introduces question marks into calculations. The history of the application of the process to the mining of sulfur is re-

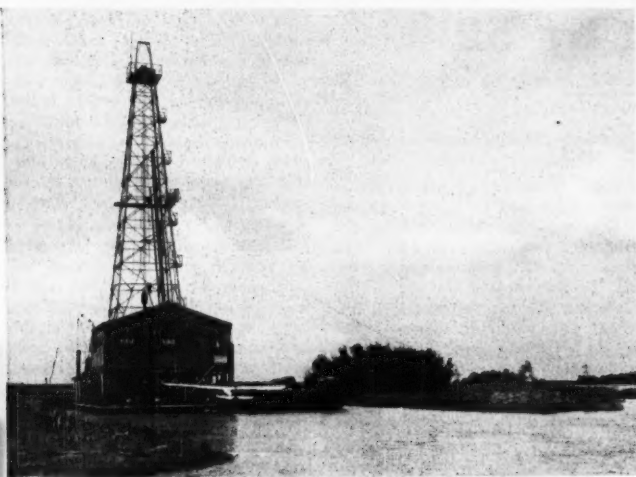
plete with examples of how geological uncertainties upset operations. A fissure in a cap rock, for instance, may let all of the hot water escape without pumping out any molten sulfur. Or unexpected conditions might require inordinate amounts of hot water to do the job. Then too, these problems are often compounded by the fact that marshland covers some of the deposits to be opened.

Italian Question Mark: The other big poser in the tabulation of new supplies is the reported increase in Italian production of about 250,000 long tons per year. It is likely that this increase could be made. But the problem is whether or not the Italians will use the technology required to put these deposits on a firm economic footing. Because many of the deposits to be opened are old mines, it is probable that this addition at

New Sulfur Sources

Country	Company	Location	Source	Production due	Est. Production long tons (yr.)	Remarks
Australia	Gov't. aid to 4-company combine	Naime	Pyrite		30,000	
Canada	Canadian Industries, Ltd.	Copper Cliff, Ont.	Recovery from sulfide smelter	Summer 1952	45,000	Liquid sulfur dioxide is product
	Consolidated Mining & Smelting Co.	Trail, B. C.	Pyrites from tailings		60,000	Sulfuric acid is product
	Dominion Tar & Chemical Co.	Alberta	Frasch			Exploratory drilling
	Golden Manitou	Barvau Mine, Que.	Zinc sulfide concentrates		15,000	
	Royalite Oil Co.	Turner Valley, Alberta	Natural gas	1952	10,000	
	Shell Oil Co.	Jumping Pond Field, Alberta	Natural gas	1951	10,000	
Columbia	Industries Purace, S. A.		Surface sulfur	Late 1951	12,000	To use new process of Chemical Construction Corp.
England	Combine of Imp. Chem. Ind. Fisons & Courtaulds	Merseyside	Anhydride	Early 1953	50,000	Sulfuric acid
Italy		Sicily	Native sulfur	Late 1951	250,000	Probably high cost product. Partially from reopening old mines.
Mexico	Compania Exploradora del Istmo, S. A.	Exporation				Affiliated with Texas Gulf Sulfur Co.
	Guanos y Fertilizantes		Natural gas	Recently started	22,000	Produces ammonium sulfate
	Mexican Gulf Sulphur Co.	Tehuantepec	Frasch	1953	200,000	With aid of loan of \$1,875,000 from Export-Import Bank
	Petroleos Mexicanos	Poza Rica	Natural Gas	Recently started	50,000	Built by General Chemical who has first call on 1/2 of production at \$1/ton.
Norway	Elektro Kjemisk		Pyrite	1952	150,000	With financial aid of government
Scotland	Sandilands Chemical Works	Aberdeen	Pyrite	Late 1952	12,000	Sulfuric acid is produced.
Spain	Government trying to stimulate	Increased export of pyrites				
United States	Bethlehem Steel Co.	Sparrows Point, Md.	Pyrite	1953		Pyrite tailings from magnetite mine.
	Consolidated Chemical Industries Co.	Baton Rouge, La.	Refinery gas	1952	10,000	
	Freeport Sulphur Co.	Bay Ste. Elaine, La.	Frasch	Late 1952	140,000*	Mine to use 1.75 million gallons of water/day.
	Freeport Sulphur Co.	Garden Island, La.	Frasch			Exploratory wells now being drilled
	Freeport Sulphur Co.	Nash Dome, Tex.	Frasch			Exploratory wells now being drilled
	Freeport Sulphur Co.	Venice Dome, La.	Frasch			Exploratory wells now being drilled
	Garfield Chem. & Mfg. Corp.	Garfield, Utah	Smelter Gases		5,000	To produce sulfuric acid.
	Jefferson Lake Sulphur Co.	Starks Dome, Tex.	Frasch	Recently started	80,000*	Mine to use 1 million gal. of water/day.
	Lion Oil Co.	Magnolia, Ark.	Natural gas	End 1951	3,500	
	Mathieson Chemical Corp.	Stamps, Ark.	Natural Gas	1952	21,000	
	Odessa Natural Gasoline Co. and Sid W. Richardson, Inc.	Odessa, Tex.	Natural Gas	End 1952	7,000	
	Phillips Chemical Co.	Goldsmith, Tex.	Natural Gas	1952	35,000	
	Sid W. Richardson, Inc.	Keystone, Tex.	Natural Gas	End 1952	9,000	
	Shamrock Oil & Gas Corp.	Dumas, Tex.	Natural Gas	Summer 1951	10,500	
	Stanford Oil & Gas Co.	Slaughter, Tex.	Natural Gas	1952	14,000	
	Texas Gulf Sulphur Co.	Spindletop Dome, Tex.	Frasch	1952	310,000*	Mine to use 4 million gals. of water/day.

* Bureau of Mines estimates total production of 530,000 tons for the three new domes. Any estimate of production from a given dome is fraught with danger as amount of water required/ton sulfur varies widely from one dome to another and possible fissures in the cap rock may make any production impossible.



DIGGING DEEP: Even marshlands aren't overlooked in search for sulfur.

best will represent only a marginal supply increase for which the consumer will have to pay more than the market price. Regardless of circumstances, however, the Italian expansion, if carried out, will provide a welcome addition to world supplies.

More Pyrite: More pyrite will probably be mined and used for its sulfur content than is indicated by current estimates*. This will add a sizable plus factor to the supply. It is known, for instance, that the Spanish government is making concessions in an effort to increase the export of pyrite, though no estimate is available of the possible increase from this source. Fortunately, no new mines will have to open for several hundred thousand tons of sulfur to be made available. Reason: Prior to World War II Spain was exporting about twice as much pyrite as in 1950 and there is no basis to believe that this quantity could not again be made available for export.

This Continent: Further evidence of plans for an increase in pyrite burning is provided by the Dorr Co. One month ago 38 contracts were in hand for installation of its new "Fluorolids" pyrite burner. Also Noranda Mines Ltd. is believed to be planning

a plant for production of elemental sulfur, sulfur dioxide and sintered iron oxide from iron pyrite using its new process. First scheduled for Hamilton, Ont. the new plant will be located instead somewhere further east on the St. Lawrence River in Canada.

Surface Sulfur: The first plant using chemco's new process for the recovery of sulfur from surface deposits is scheduled onstream late this year. Relative to the total quantities required, the capacity (12,000 long tons/year) is small but it may portend wider use of surface deposits which exist all over the World. It is known that at least three companies are considering production of surface sulfur from the sizable deposits that exist in Wyoming and it is probable that some from this source will be on the market by 1953, if not before that time.

Certainties: The output from the other sources, hydrocarbon gases, smelter gases, and anhydrite, represent quantities which can be estimated with a great deal of accuracy. This 20% of the total can be counted upon to come in on time, barring difficulties in procurement of the necessary equipment. Also this figure will undoubtedly be increased by a sizable

amount as several oil companies and natural gas producing companies are either studying production from their hydrogen sulfide-containing gases or awaiting receipt of certificates of necessity, which will provide 5-year amortization of the new plant.

Enough: There will be enough sulfur by 1952, but it will cost more—not enough more though to disturb sulfuric acid's preeminence as the most important chemical the sulfur scramble continues.

Cyanide Pinch Eases

The squeeze in sodium cyanide is beginning to relax its pressure on the purses of once-frantic spot buyers. Today, most non-contract consumers are paying 28-30¢ a pound in the resale market, a good-sized drop from the peak price of 35¢ that prevailed only three weeks ago. Surprisingly enough this decline took place despite a lively export traffic.

The price downturn is the outcome of two supply developments. Currently, increasing imports have been the main factor. But a more lasting effect will soon be felt from the burgeoning domestic facilities for sodium and hydrogen cyanides set off by synthetic fiber demand. In a few years a large part of sodium cyanide output could come from hydrogen cyanide instead of the customary "other-way-around."

More Output: Every chemical reseller who has been doing a thriving business in sodium cyanide, eyes the prospects of a large supply boost with some concern. By the end of 1952 U. S. production of cyanide is slated to top 190 million pounds annually.

Expansion in cyanide production comes at an opportune time for the growing company of industrial users. Signs already point to the conclusion that the renaissance European industry will keep more and more of its production for its own needs.

In-and-Out: It is fortunate that sodium cyanide imports have not slowed down. Otherwise, resale prices might have zoomed out of view. Most of the added supplies have been coming from Germany, a 3 million pound supplier last year. Stepped-up imports in recent weeks make 1951 totals likely to exceed those of 1950.

But there's no doubt that by the end of next year, the five year quadrupling in output will put U. S. buyers in an improved position, considerably lessening future dependence on imports. Cyanide has become a full-fledged citizen of the American chemical economy.

New World Sulfur Production

(M tons of equivalent sulfur per year)

Source	1951		1952		1953		Grand Total
	U. S.	Other	U. S.	Other	U. S.	Other	
Frasch	80	...	450	...	...	200	730
Other Natural Sulfur	...	262	...	...	...	...	262
From Hydrocarbon Gases	14	96	10	...	...	...	202
Pyrite	162	...	90	...	252
Smelter Gases	45	5	15	...	65
Anhydrite	50	...	50
Total	94	344	546	217	5	355	1561

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BOOKS

Industrial Oil and Fat Products, second edition by Alton E. Bailey. Interscience Publishers. New York, N. Y.; 992 pp., \$15.

This second edition reports on advances made in the research and technology of the fats and oils industries during the last six years while still retaining the essential outline and scope of the previous volume. As a text on oil and fat technology, the major part of the book is devoted to a discussion of commercially important oil and fat products—their chemical and physical nature, industrial utilization and unit processes used in their manufacture. Also treated are the various fatty raw materials with reference to their characteristics and availability.

The Physical Chemistry of Lubricating Oils, by A. Bondi. Reinhold Publishing Co., New York, N.Y.; 450 pp., \$10.

For engineers, physical chemists and technical men in the field, this volume presents up-to-date facts and theories concerning lubricating oils, indicating at the same time the physical principles, underlying their action. Attention is given to all types of additives as well as synthetic lubrications. The author discusses such properties as viscosity, pour point, flowing characteristics, etc. with a view to aiding in the solution of basic problems involved in the practice of lubrication.

Advances in Catalysis and Related Subjects, Volume III edited by W. G. Brandenburg, I. Komarewsky and E. K. Rideal. Academic Press, Inc., New York, N.Y.; 378 pp., \$8.

This is the third volume in the series which is designed to give an authoritative account of the major problems and developments in catalytic research and practice including the theoretical aspects of the subject. This book fur-

nishes the reader with information on such diverse catalytic problems as the use of magnetochemical methods as new tools in studies of solid catalysts, the various phases of cracking, the mathematical relationships between pore structure of a catalyst and its activity.

The Biochemistry of the Nucleic Acids, by J. N. Davidson. John Wiley & Sons, New York, N.Y.; 163 pp., \$1.75.

This is the first in a series of monographs entitled, "Methuen's Monographs on Biochemical Subjects" which presents brief informative accounts of basic principles and developments in the various branches of biochemistry. In this volume the author outlines the main features of the nucleic acids and nucleoproteins, keeping in mind the biochemical student, the chemist and the biologist. A list of references to reviews and original papers appear at the end of each chapter.

Alkali Soils, by W. P. Kelley. Reinhold Publishing Corp., New York, N.Y.; 168 pp., \$5.

A monograph devoted to alkali soils—their formation, properties and reclamation, this volume deals with the problems involved and their solution in terms of ion exchange. The author compares conditions in western United States and in Russia where work has been done on the same subject. Previous research in the field is reviewed and evaluated.

Handbook of Agricultural Pest Control by S. F. Bailey and L. M. Smith. Industry Publications, Inc., New York, N.Y.; 191 pp., \$3.25.

Prepared for use by the custom spray operator, the pest control operator, farm advisor, field worker, etc., this handbook covers the agricultural chemicals—insecticides, fungicides,

herbicides, plant hormones, nutrient sprays, defoliant—with respect to their rates of application, formulas, fumigation, spray machines and toxicology. The authors also cover the topics of dusts, and dusting, aircraft and mosquito control. Here the reader can also find fundamentals and data needed in making estimates and other planning and application activities involved in working with agricultural chemicals.

The Vitamin B Complex, by F. A. Robinson. John Wiley & Sons, Inc., New York, N.Y.; 688 pp., \$9.

The author has made an intensive study of the vitamin B complex; he has evaluated the significance of each member vitamin itself and in relation to each other. In noting the similarity of the individual vitamins in their distribution in foodstuffs, biological functions and biological effects, he corroborates the thesis that all these vitamins are biologically related, having basic metabolic processes common to all living organisms.

Briefly Listed

PAPAIN, by M. L. Tainter and 12 others. Volume 54, Article 2 from the Annals of New York Academy of Sciences. A 154-page study of the proteolytic enzyme "papain," including a description of the tropical plant which is its source and the processing of the product in addition to a review of the literature on the therapeutic significance of papain. From the New York Academy of Sciences, 2 East 63rd St., New York, N.Y., for \$3.

MEETINGS . . .

Soc. of Chem. Industry, annual gen. meeting, London, England, July 9-13.

Summer Seminar in the Chem. of Nat. Products, Univ. of New Brunswick, Fredericton, N.B., July 10-14.

Gordon Research Conf. (AAAS), New Hampton, N.H., July 23-27.

Natl. Soybean Processors Assn., annual meeting, Edgewater Beach Hotel, Chicago, August 16.

Amer. Pharm. Assn., Statler Hotel, Buffalo, N.Y., August 26-31.

Summer Symposium, Nuclear Energy Development, annual meeting, Oak Ridge, August 27-September 7.

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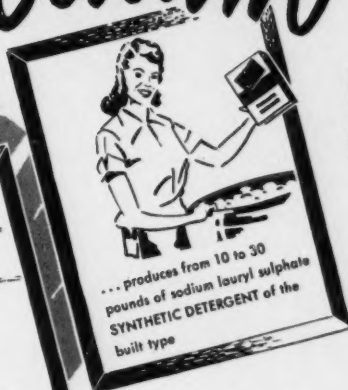
PICTURES IN THIS ISSUE

Cover (top) — Mathieson Chemical Corp.; Cover (middle) — Celanese Corporation of America; Cover (bottom) — Mathieson Chemical Corp.; p. 12 — Sid Carson—McGraw-Hill; p. 21—Robert Yarnall Richie; p. 34—Leon Trice.

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Products and literature in this issue are listed on these pages. There are three indexes. (1) Editorial items on new products, new equipment, new literature; (2) products advertised. (3) The index of advertisers is on the following page.

THE NUMBERS

Advertisements:—There is a page number on the coupon for each advertisement. Before the number, may appear, L, R, T, B (left, right, top, bottom), locating the ad on the page; small letters following (a,b,c) indicate additional products in the advertisement.

Editorial Items:—Numerals are page numbers; the ABC's distinguish among items where more than one is on a page. There is a number on the coupon for each item referring to new products, equipment, and literature.

EDITORIAL ITEMS

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NEW EQUIPMENT

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Thermostat	22D

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Plastic Preforming	40H
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GENERAL

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Ammonium acid fluoride	T22a
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Butyl oleate	T26b
Butyl stearate	T26a
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Copper sulphate	T29a
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Ethyl amine	42a
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Expires September 30, 1951

BOOKLETS

Chemicals

*Miscella Concentration Chart

4-p. folder containing tallow miscella concentration chart for processors concerned with design calculations, plant operation and interpretation of operating data; the chart covers mixtures of tallow in commercial heptane, giving the concentration by weight. American Mineral Spirits Co., 230 N. Michigan Ave., Chicago 1, Ill.

Unpurified Cellulose Gum

8-p. technical booklet concerned with "CMC-CT," the unpurified cellulose gum which is said to greatly improve whiteness retention properties of synthetic detergents and built tallow soaps, and has also shown detergent activity itself when used with these materials. Typical properties and formulas are noted in addition to performance data. Hercules Powder Co.

Grinding Oils

Bulletin devoted to two grinding oils fortified with polymerized linseed oil especially developed for use in modern low-oil-content quality house paint. Constants, characteristics and a number of tested formulas using the two grinding oils are included here. Archer-Daniels-Midland Co.

Protective Coating

Folder entitled, "How to Obtain A Grade 1 (or Equivalent) Finish on Steel," describes special protective coating to be used along with paint finish for most ordnance items in order to conform to government specification; reference is made to equipment used, various processes and sequence of operations. American Chemical Paint Co.

Equipment

Voltage Regulators

12-p. bulletin explaining the operation and construction of its line of automatic voltage regulators, used in maintaining a constant output voltage regardless of fluctuations in a-c input line voltages and changes in output load. Outline drawings, performance and engineering information are included. The Superior Electric Co.

Glass Volumetric Apparatus

22-p. manual discussing the proper handling, care and calibration of volumetric glassware prepared for scientific and clinical laboratories as well as chemistry students. Illustrations and six tables accompany the discussion of systems of weights and measure, cleaning apparatus, gravimetric and volumetric calibration and delivery characteristics of burettes and pipettes. Kimble Glass, Owens-Illinois Glass Co.

* Request must be made to company on business letterhead.

Corrosion Notebook

16-p. corrosion notebook containing data on the corrosion resistance of various types of stainless tubing and pipe, describes types of corrosion, and provides data according to type of corrodent at various concentrations. The Carpenter Steel Co.

Aluminum Paint

Technical bulletin sheet describing the advantages of firm's aluminum paint to be used as a protective coating in chemical manufacturing and processing plants—wherever corrosive conditions prevail. Prufcoat Laboratories, Inc.

Plastic Preforming

Brochure devoted to plastic preforms—partially compressed pieces of raw plastic from which finished plastic parts are molded. Booklet explains the purpose of preforming plastic parts and also discusses their properties, methods of preforming, punches and dies used for preforming, etc. The F. J. Stokes Machine Co.

Valves, Flanges, etc.

Bulletin discussing flanged gate valves, designed for all-round corrosion-resistant application and needle valves for use wherever high frictional resistance is of no disadvantage; other items covered include flanges, hose nipples, bars, welding electrodes and screw machine products. Worthington Pump & Machinery Corp.

Explosion Proof Bells

4-p. bulletin presenting various types of explosion-proof bells and giving information on their operational and constructional features, design and assembly details. Signal Engineering & Mfg. Co.

Plastic Packings

4-p. bulletin featuring "versi-pak" non-jacketed plastic packings, a relatively inert packing with high compressibility that provides positive sealing at high pressures while maintaining relatively low pressure on the packing gland; recommended for use on reciprocating, centrifugal and rotary equipment. Raybestos-Manhattan, Inc.

Diaphragms

Brochure detailing properties and designs of a wide range of synthetic coated diaphragms for all types of gas meters. Vulcan Rubber Products, Inc.

General

Motor Service

4-p. booklet with map showing firm's service stations in the country, features photographs of the production and inspection of electric motors, along with other pictures of the metallurgical, welding and electrical research laboratories. A. O. Smith Corp.

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TRI-SURE PRODUCTS LIMITED, ST. CATHARINES, ONTARIO, CANADA

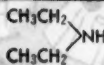
do these
ETHYL AMINES
 fit into YOUR
 product picture?



ETHYL AMINE



DIETHYL AMINE



TRIETHYL AMINE



*How you can
 use them . . .*

ETHYL AMINE*

- as a volatile alkali in process industries.
- as an intermediate for making: emulsifiers, plasticizers, dyestuffs
- as a deflocculating agent in manufacture of ceramics.

DIETHYL AMINE

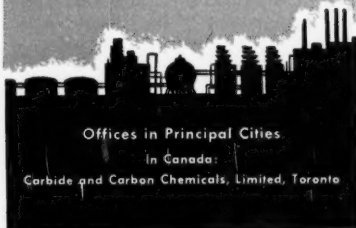
- as an intermediate for making: rubber accelerators, insecticides, pharmaceuticals, dyestuffs
- its sulfamic acid salt is an effective flame-retardant plasticizer for paper.

TRIETHYL AMINE

- as an inhibitor for chlorinated solvents.
- as an anti-livening agent in urea- and melamine-based enamels.
- for solubilizing 2,4-D, a selective herbicide. Only 101 lb. of Triethyl Amine needed to neutralize 221 lb. of 2,4-D.

CARBIDE AND CARBON CHEMICALS COMPANY

A Division of
 Union Carbide and Carbon Corporation
 30 East 42nd Street **UCC** New York 17, N. Y.



Offices in Principal Cities

In Canada:

Carbide and Carbon Chemicals, Limited, Toronto

All three of these amines are available in commercial quantities. One of them may be just the answer to your product or process problem. Investigate them now by asking for samples and information on your company letterhead. Be sure to ask for technical bulletin F-7408A, "Alkyl Amines."

OTHER ALKYL AMINES

When you are considering alkyl amines, keep in mind that CARBIDE also supplies *n*-Butyl, Di-*n*-Butyl, Isopropyl, Diisopropyl, 2-Ethylhexyl, and Di (2-Ethylhexyl) amines. Samples and technical data are available to help you evaluate them.

*Commercial grade is a 70% aqueous solution.